THE

AMERICAN GAS-LIGHT JOURNAL.

THE OFFICIAL GAZETTE OF

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

Rooms—No. 39 Nassau Street, cor. Liberty Street, opposite the Post-Office, New York.

LONDON:—TRUBNER & CO., No. 60 PATERNOSTER ROW.

VOL. IV.—No. 73. NEW-YORK, THURSDAY, JANUARY 1, 1863. $3 PER ANNUM.

PETROLEUM ITEMS.

THE VENANGO OIL REGION OF PENNSYLVANIA.—Before the discovery of oil by well-boring for salt, three years ago, on Oil Creek, the county of Venango was seldom heard from, save in election times when returns of votes cast were impatiently awaited, because it was isolated from the public improvements, and had no means of communication, except the stage coach. To be sure, the Allegheny river passed through it, and valleys and ridges corrugate its surface; but then valleys and ridges abound in Pennsylvania, and hence, unless blest with deposits of mineral wealth or otherwise serving as storehouses for nature's gifts, valleys are supposed to be divided into forest and savannah, and to form a part of the common domain of agriculture.

It is true that the State, in the prosecution of her system of canals had, *almost* completed the Franklin Division in Venango, when she suspended the work of construction twenty years ago; still, the Franklin Canal was *not* finished by the State, nor by those to whom the State made a donation of the Erie and Beaver—Lake Erie and Ohio river Canal. And down to a few months ago in this present last half of 1862, when the Oil Creek Railroad was opened from Corry to Titusville, 27 miles, there was not one mile of railroad in use in Venango county; soon, however, Venango county will boast a second railroad, extending to Franking from Meadville; nor will it be long till a third and perhaps a fourth railroad will penetrate into Venango county, to the sources of its prosperity, the foundations of its wealth—the wells of its oil region. Never was transition more marked and absolute than that which Venango county has undergone in three short years. And from having the reputation of containing much surface of doubtful value and indifferent fertility, Venango county now exults in the possession of oil producing acres of greater value, according to area, than any land in the auriferous region of the far West, where the precious metals adorn mountains of quartz rock, and sands of gold sparkle in the beds of rivers and the prisms of brooks.—*U. S. Railroad and Mining Register.*

THE PETROLEUM TRADE.—The Oil City *Register* of December 4, says: "Since our last report the market has been quiet. The Allegheny being too low for navigation, and this being the only mode of getting the oil to market, together with the high rates asked by the boatmen for freights, has caused a slight temporary decline. If we have another freshet, taking the past few weeks as a criterion, prices will range considerably above any prices as yet given. We quote oil at the wells firm at $5 50 @ $6. At this point $10, including barrels. There were no large transactions since our last, from the reasons above stated. Two more wells, the Ladies' and Butchers', on the Story Farm have stopped flowing. These wells were flowing about 150 barrels each. There is no great quantity of oil in tank up the creek. Our wharves are pretty well cleaned out. Quite a number of our oil boats are aground between this point and the mouth of Clarion river.

"We have heard of the loss of several boats, and about 3,000 barrels of oil, but have no particulars. Prices of barrels $3 50 @ $3 75 for prime. Freights to Pittsburg $2 25. The Pond Freshet of to-day was a good one. We have heard of but two boats being lost, both of which were loaded with barrel oil. Most if not all of this will be saved. The shippers and boatmen seem to have profited considerably from the experience of the previous freshets. We should estimate the total that has come out of the creek in the last three freshets at 30,000 barrels. We learn that a movement is on foot to conduct our oil to various points on the railroad by means of pipes. The projector seems sanguine as to the success of his plan, and a corps of engineers are now locating it. We shall endeavor to give a full description of it in our next. Our market closes firm, with a fair amount of transactions. The river is stationary, with about fifteen inches in the channel. The weather is moderate."

"A RICH PLACER.—We question whether any other locality of the same size in the world, has yielded so great an amount of wealth in the same length of time, as the Venango oil region. The present oil producing territory is about eight miles long by forty rods in width, including Oil Creek, which is twelve rods wide. As to the value of the oil produced from the space heretofore, we have no official record, but from the best information we can gather, it has not been less than $4,000,000. It will in all probability far exceed that sum. The number of persons engaged in the oil business, as manufacturers, dealers, &c., in the United States, is estimated at 7,500. The amount of capital invested in the various branches of the oil trade is estimated at $10,000,000."

"The present daily yield of our wells is about 4,000 barrels. And the value of this at present prices is $25,000. This of course is exclusive of the daily product of our refineries, some thirty in number, of capacities ranging from fifteen to three hundred barrels per day. The amount of oil refined per day is about 1,000 barrels, and is now quoted here at 70 to 80 cents per gallon. The value of this added to the amount produced by the wells, swells the sum total of the daily income of the oil region very materially. This immense business has been builded up in the short space of a little overthree years. The oil trade is as yet in its infancy. The proportions it will assume when it arrives at maturity, we leave to the imagination of the reader. The estimates given above are, we think, rather under than above the mark."—*Oil City Register.*

CANADIAN OIL NEWS.—The Canada *Free Press* thus refers to oil matters in that region: Matters are looking bright for the owners of land in the oil territory. Canadians, with a supineness really remarkable, have allowed Americans on the one hand, and British capitalists on the other, to take hold of and develope the resources of the country, and carry a good part of the profits away. But it is better that this should be the case than that the wealth should lie undeveloped. It is well known that a British company, with large capital, has been formed to work the oil business, and active operations may be soon expected to commence. We learn that the directors of the Canadian Native Oil Company have published their first report to the shareholders. Premises for the storage of many thousand barrels have been secured on the river below Gravesend, about thirty miles from London. The special commissioners who were appointed to investigate the property of the company in Canada have reported very favorably upon the oil springs, the fertility of the land, and its adaptation for agricultural purposes. The lands have been purchased, a chemist has been charged with the superintendence of the works in Canada and arrangements have been made with the Grand Trunk line for transporting the produce. The 5,000 shares reserved for Canada are to be issued in England, with preference, of course, to existing shareholders, the subscription to which was to be closed on the 1st of December. In the spring the necessary works will be commenced, and then we shall know more of "ile" than we do at present.

DECREASE IN THE QUANTITY OF OIL.—The *Register* notices a gradual decrease in the quantity of oil as follows: There is a gradual decrease in the quantity produced by most of the wells now flowing. Some few have increased. But these are rare exceptions. What change may be effected by boring deeper, or by pumping, yet remains to be tested. We notice in a Canada paper that their oil wells are falling off in production very materially. In fact, the journal referred to, expresses a fear that they will fail entirely.

PETROLEUM FOR FUEL.—The Oil Springs, Canada, *Chronicle* says that refuse petroleum is being used in that place for fuel, with great success. The saving in coal and wood is said to be immense.

THE PENNSYLVANIA OIL BUSINESS.—The Oil City *Register* of Dec. 11th, quotes petroleum at $9.50 to $10 per barrel, packages included. Oil at the wells is named at $5 to $6 per barrel, packages included, and one sale heard of at $8. Holders are firm at these quotations. Navigation is closed, and the roads are in such a bad condition that very little or nothing is done. The loss by the late pond freshets and the ice is estimated at 40,000 barrels, and the value of the oil lost at $500,000.

PRICE OF OIL IN CANADA.—The Oil Springs *Chronicle* of Dec. 11 says: The oil market still continues brisk, although prices for refined have a somewhat downward tendency. Refined is selling at 35 to 40 cents per gallon. Crude is selling at 50 to 75 cents for future delivery. There is quite an active demand among our refiners at these rates. Prices have an upward tendency, and will probably in a short time be much higher.

PETROLEUM IN ENGLAND.—A public meeting of the ratepayers of Birkenhead was held on a recent Monday afternoon for the purpose of considering the proposal of the Docks Board, to erect petroleum stores on the margin of the great float, and of private parties to establish rectifying houses in connection with the petroleum trade. Many of the principal residents of Birkenhead were present, and several of the speakers declared that if the petroleum works were continued the health of Birkenhead would be greatly injured. A physician, said the chairman (Mr. Hind), described it as seriously prejudicial to health; a flour dealer stated that his stock of flour was constantly being ruined; greengrocers and others all complained in the same manner. Many people had already suffered very severely from petroleum; their appetites were affected; they could not sleep at night, for, although the windows were closed, the stench got in, and they felt as wretched as if a cloud hung over them. Mr. A. C. Cowie predicted the ruin of Birkenhead as a place of residence for Liverpool merchants and others, if the petroleum trade was located in it. It was ultimately agreed to memorialize the Mersey Docks Board on the subject, and a deputation was appointed for this object. —*London Grocer.*

PERILS OF LIGHTHOUSE KEEPERS.—The keeper of the Blainville lighthouse, opposite Goutances, France, with his wife and daughter, a few days since narrowly escaped death from starvation, all communication with the shore having been cut off during six days by a severe tempest. For five days they were without provisions, and, when at length relieved, they were entirely exhausted. The daughter of the keeper, a girl aged sixteen, appears to have particularly suffered from hunger, and the emotion caused by the probability of a dreadful death.

REPORTS OF GAS-LIGHT COMPANIES.

PITTSBURGH, PA.

PRESIDENT'S REPORT.

To the Stockholders of the Pittsburgh Gas Company:

Gentlemen,—Pursuant to the provisions of the charter of the company, I beg leave to present a statement of the operation of the works during the past year, and their present situation, with the usual reports.

There were laid last year five thousand four hundred and thirteen (5,413) feet of main pipes, of which thirty-five hundred and forty-seven (3,547) feet were used to replace an equal length of smaller pipes, which will be made available for other extensions. The large pipe has been chiefly laid in Penn street, between Mechanic and Morris streets, and although scarcely at present required for the supply of that portion of that city, will doubtless prove advantageous when the numerous manufactories in that vicinity shall be again in full operation. The total cost of extensions for the past year is four thousand three hundred and sixty-eight 25-100 dollars, and from the present high rate of pig metal, could not now be made for the same expenditure.

The total length of mains of various sizes now in use, is one hundred and sixty-one thousand eight hundred and sixty-eight feet (161,868), nearly thirty miles and two-thirds.

The coal carbonized during the year was two hundred and ten thousand one hundred and ninety-six (210,196) bushels, and the entire quantity of gas furnished to private consumers, public lamps, and city offices, was seventy-two millions eighty-one thousand two hundred and fifty-six (72,081,256) feet. The difference between this amount and the gas credited in the profit and loss statement, arises from the gas furnished to the customers in that division of the city, due on 1st July, which is not included in the accounts rendered, showing for the first time since the Works were constructed, a decrease in the annual consumption from the former year.

The average number of retorts in use during the year was thirty-three; and average number of hands employed on the works was forty-one.

There have been ninety-four services laid, and eight public lamps erected, during the past year, making in all three thousand and thirty-four of the former, and five hundred and sixty-seven of the latter.

The demand for coke and tar still continues, and their produce nearly meets the cost of the coal used.

In consequence of the arrangements made for supplying the city lamps, the amount of the national tax on gas will bear heavily on the profits of this company; but as the trustees are desirous of accommodating the community to the extent of their ability, the board has decided to continue to supply the gas at its present rate, at least for six months, by which time they will be able to ascertain whether, by care and economy in the Works, they can still render the stock reasonably profitable to the holders, without raising the price of gas to private consumers. The tax will amount to about eleven thousand dollars per annum.

The buildings and apparatus are in excellent order, and for particular details, I refer to the accompanying statements.

I take pleasure in stating that the conduct of the engineer, treasurer, and other persons employed by the company, continues to meet the approbation of the board.

Rejoicing that the welfare of the company has sustained so little injury from the embarrassed condition of affairs,

I am, respectfully,
Your friend and fellow-citizen,
THOS. BAKEWELL,
President Pittsburgh Gas Company.

Pittsburgh, August 1st, 1862.

ENGINEER'S REPORT.

To the President and Board of Trustees
of the Pittsburgh Gas Company:

Gentlemen,—I respectfully submit for your consideration the following statement of the operations and condition of the Works entrusted to my care, for the year ending on the 30th June, 1862.

The coal carbonized during the year, amounts to two hundred and ten thousand one hundred and ninety-six bushels, and the gas distributed to private consumers, public lamps, Mayor's office, water-works, market-houses, and consumed on the Works, to seventy-two million eighty-one thousand two hundred and fifty-six cubic feet, being two million nine hundred and one thousand one hundred and forty-one cubic feet less than the amount distributed the previous year, but within six per cent. of the average production of the coal carbonized, which is about the amount lost in distribution by leakage and condensation in the mains. This is the first time in the history of the Works, that the consumption of gas has fallen below that of the preceding corresponding period.

The maximum number of retorts in action within the past year was forty-five, and the average number in use during the year was thirty-three.

The number of men at present employed in all the departments of the Works is thirty-six, and the average number employed during the year was forty-one.

The street mains laid during the year, amount to five thousand four hundred and thirteen feet, from which we have to deduct three thousand five hundred and forty-seven feet of pipe lifted and replaced by larger mains, leaving one thousand eight hundred and sixty-six feet to be added to the mains previously laid, making the aggregate of mains at present in use one hundred and sixty-one thousand eight hundred and sixty-eight feet, or nearly thirty and two-thirds miles.

The annexed table exhibits the size, extent, and location of the lines of street mains laid within the past year, as follows, viz.:

Penn street, from Mechanic to Morris street...	3,448	feet of	8 inch
Carroll street, from Penn to Smallman st.....	324	"	3 "
Marion st., between Penn'a ave. and Forbes st.	86	"	3 "
Ross st., between First and Water sts.....	119	"	2 "
Liberty st., from Harrison to Carson sts.....	821	"	3 "
First st., between Short and West sts.....	81	"	2 "
Hancock st., between Penn and Duquesne Way	54	"	3 "
Webster st., bet. Washington and Congress sts.	46	"	2 "
Fifth st., from Smithfield to Cherry alley.....	282	"	3 "
Wylie st., between Fulton and Crawford sts...	114	"	9 "
Etna st, between O'Hara and Walnut sts.....	38	"	2 "
	5,413	"	
Deduct pipes lifted and replaced by larger mains.....	3,547	"	
	1,866	"	
Mains laid previous to June 30th, 1861.....	160,002	"	
Aggregate of mains at present in use.....	161,868	"	

Or nearly thirty and two-third miles.

Since the last annual report, there have been ninety-four services laid, and eight public lamps set, increasing the number of services to private consumers to three thousand and thirty-four, and the public lamps to five hundred and sixty-seven.

The demand for coke and tar has been equal to the production of the Works during the past year, all being disposed of as soon as produced, leaving none on hand at the close of the year.

All the departments of the Works are in excellent condition, capable of producing double the amount of gas that has hitherto been required of them, and will require but a moderate expenditure to maintain them in their present efficient condition. Respectfully,

JAMES THOMPSON, Engineer.

Office of the Pittsburgh Gas Co., June 30th, 1862.

MANUFACTURING EXPENSES.

Pittsburgh Gas Company, June 30th, 1862.

Dr.

To Stock on hand		5,449 68
Wages	$20,199 67	
Retorts and Castings	1,529 89	
Wrought Iron and Nails	88 48	
Coal and Slack	10,159 51	
Lime	673 28	
Lead, Oil, &c.	117 01	
Printing, Reports, Books, Bills, &c.	149 68	
Exchange on Currency	745 97	
Insurance	18 75	
Lumber	48 20	
Hardware and Tin-work	64 11	
Fire-clay and Sand-stone	154 50	
Chloride of Calcium	26 98	
Taxes for 1861, in part	968 18	
Taxes for 1862, in part	3,221 01	
Repairs to Works	2,436 45	
Petty Cash	575 86	
Salaries	3,600 00	
		44,577 58
		$50,027 21

Cr.

By Stock on hand	$5,277 72
Cash for Scrap Iron	47 41
Lloyd & Black for Scrap Iron	129 70
Sundry persons, for Wages, Castings, &c.	1,825 97
Profit and Loss	43,566 41
	$50,327 21

PROFIT AND LOSS.

Pittsburgh Gas Company, June 30th, 1862.

Dr.

1862. Jan. 1. To Dividend No. 30, Jan. 1862, two dollars and fifty cents ℔ share	$18,980 00	
State tax on same	949 00	
		$19,929 00
Manufacturing exp. as ℔ ac	43,566 41	
Services, for balance of account	336 60	
		43,903 01
City of Pittsburgh, for gas, credited on account.		9,256 06
Dividend No. 31, July, 1862, two dollars and fifty cents ℔ share	18,980 00	
State tax on same	949 00	
		19,929 00
Donations for balance of account		1,367 19
Sundry persons for balance		355 90
Balance		5,057 63
		$99,797 79

Cr.

1861. July 1. By Balance		1,224 40
1862. June 30. By Gas, for 56,456,700 cubic feet of gas to private consumers	75,727 69	
For 14,088,460 cubic feet of gas to public lamps, Mayor's office, &c.	10,528 84	
		86,256 53
By Coke and tar, for proceeds	11,572 23	
Fittings rented, for proceeds	357 28	
Fittings, for proceeds	140 00	
Meters, for proceeds	7 35	
Rents of real estate, for proceeds.	240 00	
		12,316 86
		$99,797 79

BALANCES.

Pittsburgh Gas Company, June 30, 1862.

Dr.

To Works	$169,890 44	
Distribution	104,959 34	
Real estate	54,810 72	
		$329,640 50
Extension fund		8,463 82
Meters		14,583 25
Fittings rented		436 84
Stock on hand		7,100 15
City of Pittsburgh		465 86
Sundry persons		2,306 56
Cash		51,389 67
		$414,286 65

Cr.

By Capital stock	$379,900 00
Dividends Nos. 28, 29, 30, and 31	20,575 00
Advances for gas to be supplied	2,854 15
State of Pennsylvania, for taxes on dividends	1,898 00
Sundry persons, for coal and lime	4,301 87
Profit and Loss	5,057 63
	$414,286 65

Trustees of the Pittsburgh Gas-Light Company.

GEORGE ALBREE, THOS. BAKEWELL, ROBERT BEER,
GEORGE BLACK, JOHN HOLMES, N. HOLMES,
JAMES KNOX, E. BRADFORD TODD, A. B. BERGER.

President,.....THOMAS BAKEWELL.
Secretary,.....GEORGE BLACK.
Treasurer,.....JAMES M. CHRISTY.
Engineer,.....JAMES THOMPSON.

HARLEM, N. Y.—One hundred and forty per cent. is offered for the stock of this company, without sellers. When Mr. Wakeman assumed the presidency of the Harlem Gas-Light Company, its stock was at somewhere about sixty cents on the dollar, or forty per cent. discount. By judicious management, by honest dealing, not over-reaching, by issuing a good quality of gas at a fair price, not charging meter rent, and paying his own taxes, Mr. Wakeman has, within a brief period of time, raised the value of the stock to nearly fifty per cent. premium, while he is respected and confided in by his constituents. Here is an example for some of the neighboring companies to follow.

GAS COAL IN INDIANA.—An investigation is now going on, under the auspices of experienced scientific men, which promises flattering results in the discovery of coal at the base of "Bunker Hill," the southern suburb of Vincennes, Indiana, on the land of Bishop St. Palais. The *Sun* says that, already, at the threshold of the "prospecting," fine specimens of bituminous and cannel coal have been found, with indications of a three-feet vein of the former and a four-feet vein of the latter. Some of the coal discovered has been used at the gas-works with entire satisfaction.

GAS CONTROVERSY IN ENGLAND.

A controversy has recently ensued between the lessees of the gas-works of Dover, England, and some of the consumers of that town, in which very angry words were used, and litigation ensued, as often happens on such occasions. Our well-known contemporaries, the London *Builder* and the *Journal of Gas-Lighting* took up the gauntlet in favor of their *protegés*, the one assuming the championship of the consumer while the other stood up for the gas lessees. The following extracts from successive numbers of these journals will tell the story.

[From the *Journal of Gas-Lighting*, Oct. 21.]

"We have often censured the readiness with which the newspapers, provincial as well as metropolitan, open their columns to attacks on gas companies. Suggestions the most absurd, and complaints the most groundless, find publicity without any difficulty, under anonymous signatures, and the replies are too often entirely suppressed. Gas companies, being public bodies, are open to attack, and it seems to be considered that they may be charged with impunity with the grossest dereliction of their duties to the public, and even with fraud. The Dover *Telegraph* has occasion to know that this facility for abuse in the columns of a public journal cannot always be given without bringing the publishers into trouble. In its publication of the 13th of September, a letter was inserted, signed 'A Gas Consumer and a Rate-payer,' containing allegations which the contractors who manufacture the gas for the Dover Gas Company assert to be defamatory libels. The writer said:

"'It seems quite impossible ever to be able to get a good supply of gas from the present contractors; but, whilst it remains a monopoly it is useless to complain, because the consumers are only laughed at, and told they cannot help themselves. There is competition in all other matters of business, and why not in gas? I venture to say there is no town in England with such bad gas light as Dover. Go into any establishment during the evening, and you will positively want *candles to find the gas*. Not only is the illuminating power bad, but I believe the quality is deleterious.'

"The professed object of the writer was to urge the corporation to take the supply of gas into their own hands, by representing that the town was insufficiently supplied by the existing company. Had the attack been directed against the gas company alone, it is probable that they would have followed the example of most other companies when assailed, and have taken no notice of such unfounded and extravagant assertions; but, as the Dover company contract for the manufacture of their gas with other parties, who are bound by stringent conditions as to the illuminating power, the purity and the sufficiency of the supply, their characters, as contractors, were called in question, and they could not, consistently with regard to themselves, quietly submit to have it publicly stated that the supply was insufficient, the illuminating power of the gas defective, and its quality deleterious. Messrs. Anderson & Jones, the contractors in question, accordingly sought to justify themselves by calling on the publishers either to give up the name of the writer of the libellous letter, or to take on themselves the consequences of its publication. The publishers shrank from the responsibility they had incurred, and mentioned a Mr. George Bennett as the writer of the libel, and to him Messrs. Anderson & Jones applied, through their solicitor for redress. The usual proceedings followed. A writ was issued, a public apology was tendered, and finally accepted, on condition that the sum of £5 should be paid as a donation to a public charity. The letter of apology was published in the Dover *Telegraph* of the 11th inst., as follows:

DOVER, Oct. 10, 1862.

'Gentlemen,—I beg to apologize for having written a letter to the Dover *Telegraph* which appeared in that journal under the signature of "A Gas Consumer and a Rate-payer," on the 13th ult. I beg to withdraw any expression that I have made detrimental to your interests; and herewith hand you the sum of £5, as a donation to the Dover Hospital, in consideration of your proceeding no further with the action at law you have commenced against me.

'I am, gentlemen, your obedient servant,

'GEORGE BENNETT.

'To Messrs. Anderson & Jones,
'Managers of the Dover Gas-Light Company.'

"So far as Mr. Bennett is concerned, the *amende honorable* has been complete; but the Dover *Telegraph* not only left him to bear all the resposibility of the publication of the libel, but endeavored, from under his cloak, to give a parting stab at the contractors. It is asserted that 'Mr. Bennet, as a gas consumer, imagined he had as much right to find fault with a gas-man as with a tallow-chandler or any other tradesman.' But neither Mr. Bennett nor any other man has a right to charge a tradesman with breach of contract, and with fraud, unless he can prove the accusations to be true; and such, in point of fact, was the nature of the charges brought against the contractors, and which Mr. Bennett has withdrawn, having no foundation for them whatever. We are glad that Messrs. Anderson & Jones have promptly vindicated themselves; and we trust their spirited conduct in the matter may serve as a lesson to other detractors."

[From the *Builder*, Nov. 1st.]

"A Dover gas consumer having recently written a letter to one of the local journals, complaining of the quality of the article supplied, and suggesting new works, the lessees of the Dover Gas-Works (Messrs. Anderson & Jones) have had the impudence to commence an action against him. The public have begun an indignation subscription; and there is little doubt that considerable opposition will arise to a renewal of the gas contract when it expires; and that Messrs. Anderson & Jones will shortly be made to feel as if they had brought a nest of hornets about their ears."

[From the *Journal of Gas-Lighting*, Nov. 18.]

"The spirited conduct of Messrs. Anderson & Jones, in defending their characters as gas contractors from the attack made on them at Dover, has highly incensed those who conceive that gas companies, and the suppliers of gas, are legitimate objects for abuse. The *Builder* has entered the field against them, and expresses astonishment at their 'impudence' in commencing an action against their calumniators; and asserts that the public have begun an 'indignation subscription'—for what object it is not stated—and that 'Messrs. Anderson and Jones will shortly be made to feel as if they had brought a nest of hornets about their ears.' Our contemporary, apparently, is not aware of the real facts of the case, nor of the charges against which the contractors had to defend themselves. It was not a mere complaint against the quality of the gas at which they felt aggrieved. Mr. Bennett, or any of the consumers in Dover, had full right to complain if he had reason to think that the quality of gas was bad, or the supply defective; but he was not justified in publicly asserting that 'it seems quite impossible ever to be able to get a good supply of gas from the present contractors;' that 'there is no town in England with such bad gas-light as Dover;' and that he believed 'the quality to be deleterious.' By such assertions the contractors were accused of having grossly violated the terms of their contract with the Dover Gas Company, and the accusation was calculated to do them injury in their business as contractors in other places. They, therefore, called on their caluminator either to prove his charges, or to retract them; and, the former being impossible, he took the latter course, and inserted a letter of apology in the same paper in which the calumny appeared. The proceedings that have since taken place in Dover have proved that there was no real ground for the complaint, and that the defective lighting which was noticed in some establishments, arose from causes entirely within the control of the consumers, and was not attributable to defective supply of gas, or to its deficiency of illuminating power. The subject was introduced in a jocular manner, at a meeting of the local board of health, on the 30th ult., on which occasion the Mayor, who is proprietor of the Lord Warden Hotel, observed that 'pretty nearly all the gas was rammed out of the pipes before it reached his neighborhood,' and that he was obliged to light a candle to read a newspaper, though there were four gas-burners in the room. Other members of the board also spoke to the same effect, and reiterated Mr. Bennett's joke, that they were obliged to light candles to see if the gas was burning. Messrs. Anderson & Jones forthwith waited upon these gentlemen, to ascertain what truth there was in such assertions; and on examining the gas-fittings and the burners, the cause of the defective lighting was discovered. In the case of the Lord Warden Hotel, which is situated at the farthest extremity of the town, at a distance of about a mile and a half from the gas-works, and on the same level, the proprietors had ill-advisedly fixed a governor between the meter and the burners, which reduced the pressure three-tenths; the flow of gas to each burner was further obstructed by the introduction of smaller 'governors,' consisting of small brass boxes filled with iron wire; and the light was also obstructed by the use of dirty ground-glass globes. When these obstructions were removed there was an ample supply of gas; and at the next meeting of the board, the mayor stated, in justice to the contractors, that he had now a very excellent light. We understand that the initial pressure at the work is so regulated as to give a minimum pressure of eight-tenths in that part of the district in which the Lord Warden Hotel is situated, and that pressure is quite sufficient for efficient lighting, under ordinary circumstances; but certainly it is not calculated to overcome the resistance of defective governors and obstructed burners. Two other members of the board, who had spoken about the dimness of the gas, were also called on by Messrs. Anderson & Jones, and the defect was in such case found to be owing to the obstruction of the gas by the burners, as they explained at the next meeting of the board. The unfounded attacks on the contractors have thus produced their own refutation; and we beg to suggest that the 'indignation subscription,' mentioned in the *Builder* should be appropriated to the purchase of a testimonial for these gentlemen."

[From the *Builder*, Nov. 29.]

"A short time ago we mentioned that the contractors of the Dover Gas-Works had the impudence to commence an action against a Dover gas consumer, one Mr. Bennett, for complaining in a local journal that the supply was very bad. The *Journal of Gas-Lighting* standing up for its Order, takes us to task for the observations; and points out that the writer of the letter had been obliged to apologize, and to pay £5 as a donation to the Dover Hospital. If the Dover 'gas consumer' said what was untrue, the oftener he is forced to apologize the better; but if gas consumers may not complain through a newspaper when gas companies fail to do their duty, to talk of the freedom of the press is a farce. Judging from the letters now before us, from some of the most respectable inhabitants of Dover, we are forced to believe that the supply of gas there is very unsatisfactory. Our cotemporary tells us that 'the subject was introduced in a *jocular manner* at a meeting of the Local Board of Health, on the 30th ult., on which occasion the Mayor, who is the proprietor of the Lord Warden Hotel, observed that pretty nearly all the gas was rammed out of the pipes before it reached his neighborhood,' and that he was obliged to light a candle to read a newspaper, although there were four gas-burners in the room. Other members of the Board also spoke to the same effect, and reiterated Mr. Bennet's joke, that they were obliged to light candles to see if the gas was burning. The *Gas Journal* then goes on to say that the cause of the defective lighting was found to be within the control of the consumers. One of our correspondents, who is much amused at the notion of attributing jocularity to Mr. Birmingham or Mr. Wakeling, who were among the complainants, says; 'And what becomes of other complaints that have not yet been made public? Shall we appeal to the great family of commercial gentlemen who stay at the Royal Oak and Antwerp Hotels, as to the illumination by which they write their orders and business letters? There is no lack of evidence to prove an insufficiency of light in Dover. And then, since the little *jocularity* so lightly passed over, there is the verdict of a whole theatre full of people, at the Royal Clarance Saloon, in Snagate street, on the 11th of November, when the proprietor (Mr. Browling), was indignantly requested to 'turn on the gas!' but, alas, he could do no more. Of course, sir, all these little things are a *joke* too. Now, as good sensible men, would it not be better for Messrs. Anderson & Jones to throw aside diguise, and say,—'As you know, gentlemen, our contract with the gas company shortly expires: we do not see our way to enter upon large expenses; and we therefore supply you to the very best of our means. Every additional lamp ordered by your lighting committee detracts from the lights already burning; and although it is to our benefit, it is to a certain extent contributed to by a corresponding diminution of consumption on your part.'

"We have a right to speak on these matters, and are

not to be deterred by the information forwarded to us, that the lawyer's bill for proceedings taken between Saturday and Thursday against the timid 'Gas Consumer' amounted to £8. Both gas companies and the public are indebted to the *Builder*, which, alone, for years, pointed out the injustice and the impolicy of the preposterous charges then made for gas. Gas companies get better dividends while the consumers are more cheaply, and, where they assert their rights, better served."

CARBURATION OF GAS IN LONDON.

REPORT ON THE RESULTS OF EXPERIMENTS TO ASCERTAIN THE CONSUMPTION OF GAS AT THE PUBLIC LAMPS, AND ON THE APPLICATION OF THE CARBURATING PROCESS, &c., &c.

Sewers Office, Guildhall, Nov. 3, 1862.

To the Honorable the Committee upon General Purposes of the Commissioners of Sewers of the City of London:

Gentlemen,—In pursuance of your reference, I have taken measures to ascertain the amount of gas consumed at the public lamps within your jurisdiction; and also, in conjunction with your medical officer of health, Dr. Letheby, to ascertain, when deficiency of light is complained of, where the carburators are affixed to the public lamps, if it be attributable to the fault of the gas company or the Carburating Company.

Thirty eight meters have been affixed, which register the consumption of gas at forty-two public lamps—the situations of which include some of the highest as well as the lowest surface levels within the City.

Of the meters—

26 are affixed upon lamp-columns.

8 are placed beneath the ground at the base of the columns.

4 are attached to the brackets of lamps projecting from the walls of buildings.

The first meter was affixed on the 2d of September, and thirty-six were affixed by the first of October; the remaining two on the 21st of October. All the following statements and averages are from observations made between the 2d of September and the 25th of October inclusive.

Seven meters were affixed to lamps at which, by the terms of the contract with the company, 5 cubic feet per hour were to be consumed: these are without carburators, and are supplied with gas by the Chartered Gas Company. Thirty-one are affixed to lamps consuming, according to contract, 3 cubic feet per hour: they are in all cases fitted with a carburating apparatus, and are supplied with gas by the Great Central Gas Company.

The indices of the meters have been carefully recorded from time to time, and the averages of consumption throughout the experiment have been found to be as follows:

For the first three nights after the meters were affixed—

	Cubic Feet per Hour.
Of the 31 meters to the 3-feet burners, 20 showed a consumption of	2.59
11 showed a consumption of	3.33
The meters affixed to the 5-feet burners showed a consumption of	4.68

The twenty meters to the 3-feet lamps then began to register, like the others, more than the stipulated quantity of gas; those upon the 5-feet lamps continued without marked alteration; the average of the whole time showing that—

	Cubic Feet per Hour.
The burners under contract to be supplied with 3 cubic feet of gas per hour consumed	3.35
The burners under contract to be supplied with 5 cubic feet of gas per hour consumed	4.69

The quantity consumed from hour to hour and at different lamps has been found to vary considerably.

With 3-feet burners, the mean range of consumption during the night has been from 1.83 to 6.30 cubic feet per hour.

With 5-feet burners, from 3.65 to 7.31 cubic feet per hour.

These are the extremes which have been observed, and there has been every variety in the rate of consumption per hour between those limits.

In some lamps there has been less than the stipulated quantity consumed for a few days; then a large increase has taken place for a few subsequent days, and then the consumption has fallen to about its average quantity. In a few instances, unusually large quantities of gas has passed through the meters between the hours at which registrations were made, which can only be accounted for, either by those lights burning much later, or by their being lighted earlier, than the contract requires, or by escape during the day.

In one instance, as much as 20 feet of gas passed through the meter between the time of extinguishing the light in the morning and lighting in the evening.

The quantity of light given at the public lamps varies, therefore, considerably: and that variation is not only between different lamps, but at the same lamp at different periods of the night, and will account partially for the extreme differences of opinion, sometimes publicly stated, as to the efficiency or non efficiency of the public lighting.

It having been reported to me that there was a manifest difference between the light afforded by those lamps having meters, and those without, and it having been likewise noticed by Dr. Letheby and myself, we have taken circuits of inspection, and found that it was very evident indeed that such was the case both at lamps with and without carburators. Time, and the means at my disposal, have not yet permitted experiments to be made, to ascertain the exact consumption at lamps without meters; but the mean of a considerable number of rough observations taken by Dr. Letheby and myself, to ascertain the distance at which a given object was visible, showed that—

	Strength of Light. Without Meters. Yards.	With Meters. Yards.
At lamps with carburators (3 cubic feet per hour, contract supply)	4.378	5.512
At lamps without carburators (5 cubic feet per hour, contract supply)	4.758	5.925

These results show, with regard to the lamps fitted with carburators, that those with meters gave about 58 per cent. more light than those without meters.

And with regard to lamps without carburators, that those with meters gave about 55 per cent. more light than those without meters.

Also that the lamps with carburators and with meters, consuming nominally 3 cubic feet of gas per hour, gave superior light to lamps without meters burning nominally 5 cubic feet of gas per hour. And that the lamps with carburators gave less light than those without carburators, when compared under similar conditions in respect of meters.

These observations were 125 in number, and were made between the hours of 8.30 p.m. and midnight.

A very few observations only, as to pressure, have been made at different places, from which it will be seen that—

	The Pressure had A maximum of	A minimum of
In the district of the Great Central Gas Co.	19-10ths.	7-10ths.
In the district of the Chartered Gas Co..	14-10ths.	6-10ths.

The pressure has been taken between sunset and sunrise only.

It should be observed that in no case was there any loss of pressure by the application of the carburating apparatus.

I requested, on behalf of the Commission, the cooperation of the police, which was at once afforded me by D. W. Harvey, Esq., the Commissioner of City Police, and I have been furnished by him each morning with an account of all the defective lights which were observed by the constables on the preceding night.

A list of the lamps having meters affixed has also been furnished to the Commissioner of City Police, with the information that such lamps might be considered as *standards* by which the sufficiency of light given by the other lamps might be judged of by the police constables.

During the period over which these observations have been made, 133 complaints have been made by the police of defective lighting, an analysis of which gives:

Lights not lighted	35
Do. feeble	11
Do. went out	87

The reports of the gas companies upon these complaints have not hitherto been made sufficiently in detail to enable me to give you a satisfactory account of the causes of defect.

I have, however, in all the cases, had examinations made of the fittings and carburating apparatus, the result of which shows that, out of the 133 complaints—

In 89 cases no fault could be discovered in the carburator or fittings.

In 12 cases the apparatus was out of order, or wanting in a due supply of naphtha.

In 26 cases there were stoppages in the fittings.

These examinations were made in most cases after mid-day—the returns from the police only reaching my office about 10 A. M.—and I am unable to state whether or not, previously to the examination by my assistants, the companies had noticed these defects, and done anything to remedy them.

The stoppages in the fittings will, of course, account for the deficiency of light in the 26 cases where such stoppages were discovered; but, with regard to the remaining 101 cases, no positive reason can be alleged for the feebleness or extinction of the light. It is most probably attributable to the wind acting upon a reduced flame, but whether such reduction of flame is owing to the carburating apparatus (where they are affixed), or to the small amount of gas consuming at the actual moment of extinction, is uncertain, although there appears to be nothing in the structure of the carburating apparatus which can possibly interfere with the issue of the gas, even if, in respect of quantity or quality of naphtha, the apparatus might be deficient.

There has not been a single instance of complaint of extinction, or feebleness of light, from any lamp to which a meter is affixed.

The total number of lamps in the city is 2,884.

The total number of complaints of light during 52 days was 133; this is at about the rate of 933 per annum, and there, therefore, is, upon the average, a defect to about 2½ lights nightly out of 2,884 public lanterns.

With regard to the naphtha—specimens taken from the public lamps have been furnished to Dr. Letheby, whose report upon that branch of the subject is subjoined.

In the foregoing pages, I have, I believe, drawn your attention to the whole of the important facts elicited by the experiments, and to those points that may be useful to you in considering the references made to you by the commission.

And have the honor to remain, gentlemen, your obedient servant,

W. HAYWOOD.

Report by Dr. Letheby on the Quality of the Naphtha supplied to the Carburators.

Eighteen samples of the liquid from the carburators have been submitted to examination, and the following are the results:

In three cases, the liquid was water slightly tainted with the odor of naphtha.

In the other cases, the liquid was a naphtha or petroleum of varying density from 888 to 840.

The boiling-points ranged from 230° Fahr. to 280°.

When tested in the carburators, by passing coal gas over the naphtha at the rate of 3½ cubic feet per hour, it was found that the proportion of hydrocarbon volatilized by the gas during the first twenty-four hours ranged from 1.43 grains per cubic foot to 4.73 grains, and that the increase in the illuminating power was from 6 to 24 per cent., but that this proportion rapidly declined.

The results, therefore, of this examination are:

1. That in one-sixth of the cases there was no naphtha whatever, but merely water in the carburators; and

2. That in no instance was the naphtha of the quality necessary to give the desired increase of illuminating power to the gas; for I have already ascertained that the naphtha should give at least 6.5 grains of volatile hydrocarbon to each cubic foot of the gas to raise the illuminating power to the required standard of 30 per cent. above the ordinary quality.

That this can be accomplished without difficulty or uncertainty is manifest from the fact, that a gallon of the naphtha of proper strength will continuously supply about 6.5 grains of hydrocarbon to each cubic foot of 9,000 cubic feet of gas. Properly distributed, therefore, a gallon and a half or two gallons of good naphtha should be sufficient for a year's consumption of gas at each lamp.

At present, however, the supply is deficient both in quality and quantity, and the results are, therefore, unsatisfactory.

I have the honor, &c.,

HY. LETHEBY.

TABLE

Of the Properties of Eighteen Samples of Naphtha taken from Carburators at the Public Lamps in the City of London, in October, 1862.

No. of Sample.	Color of Sample.	Specific Gravity. Water=1000.	Boiling Point. (Fahr.)	Gives off Inflammable Vapor at (Fahr.)	Loss from Evaporation when exposed to Air for 24 hours.	Amount yielded to each Cubic Foot of Gas.	Increase of Illuminating Power.
			Deg.	Deg.	Per Cent.	Grains.	Per Ct.
1...	Brown.	878	276	100	4.8		
2...	"	864	275	91	6.8		
3...	Amber.	1003	212	..	..	1.43	6.3
4...	"	1002	212	..	..		
5...	Brown.	893	275	104	4.0		
6...	"	884	268	98	4.6		
7...	"	841	256	80	5.9		
8..	Amber.	840	230	60	10.2		
9...	"	1003	212	..	..	2.62	12.0
10...	Brown.	880	266	96	5.5		
11...	"	884	273	100	5.7		
12...	"	888	280	99	5.9		
13...	"	826	220	60	10.2		
14...	"	838	237	81	8.8		
15...	Amber.	834	231	80	9.8	4.73	24.0
16...	"	828	248	83	7.9		
17...	Brown.	870	256	80	6.9		
18...	"	862	257	80	7.8		

The samples Nos. 3, 4, and 9, were merely water colored with naphtha.

CONCLUSIONS.

We must, in the first place, beg to remark, that the results of these experiments do not militate against the opinions we have before expressed of the conditions under which public lamps should be lighted; although, if they are taken without reference to other experience, they might lead, in some respects, to a somewhat different conclusion; and it must be said of them, that a far more varied and extensive series of observations, spread over a greater length of time, will be necessary before such observations as these can alone be made the basis of final and positive conclusions.

We have, therefore, together, well considered the general results of the present inquiry in conjunction with the observations and reports made by us since the first experiment in carburating gas at the public lamps in Moorgate street, in July, 1860, to the present time, and are of the following opinion upon the various points now before the consideration of the committee:

That, with a view to insuring the supply of the full amount of gas contracted for, we are of opinion that it can only be effected in one of two ways, namely, either by the direct and nightly examination of the quantity of gas actually issuing from various burners, or by affixing a meter to each lamp. Both of these means will be attended with expense; the former with great expense, and also with somewhat uncertain results, inasmuch as averages would have to be relied upon; and we think the second method will be the least expensive and the most reliable. It is probable, also, that the rental of a meter to each lamp, if provided and maintained by contract, would not be a considerable annual charge; indeed, evidence has of late years been adduced, both actually and inferentially, to show that economy in the consumption of gas would in this way result; but, above all, it would set at rest the doubts which now prevail in respect of the quantity of gas supplied to the lamps, and so far the adoption of the plan would be satisfactory.

Under such an arrangement the commission should undertake the entire charge of their lamps, including the lighting and extinguishing the same. They can then call upon the companies to supply any given quantity of gas per hour to the public lamps, and will be enabled to adopt, without hindrance, any improvement in respect of burners or other contrivances that science or experience may hereafter suggest as a means of increasing the power of the light, and economizing the consumption of gas.

That, as regards the carburating process at the public lamps, judging from the experiments made in Moorgate street, and those which have been conducted elsewhere, we have no doubt whatever that it may be successfully applied if the proper amount of gas is afforded, and a due supply of naphtha of a proper quality is given; and that, under these two conditions, a considerable saving may be effected in the cost of public lighting; but it is of the utmost importance, as regards the success of the process, that more precise arrangements should be adopted for the maintenance of the proper quantity and quality of naphtha in the carburators than have hitherto existed.

We have the honor to remain, gentlemen, your obedient servants,

WILLIAM HAYWOOD, Engineer.

HY. LETHEBY, Medical Officer of Health.

NEW SYSTEM OF LIGHTING THEATRES IN PARIS.—The last, and by far the most important, of the novelties of structure and decoration attempted (successfully attempted) in the new Theatre du Chatelet is the entirely original mode of lighting the *salle*. Not a single chandelier appears, large or small; and yet the house is perfectly lighted, and the richness of the architectural effect, strange to say, seems absolutely to gain by the absence of those glittering accessories of glass and lights which usually form such principal features in theatrical interiors. In some of these we are presented with a ceiling of ground glass, sparingly decorated with elegant arabesques, above which, and unseen, are jets of gas, arranged in a concentrated mass, which pour down a flood of softened and equalized light through the semi-transparent ceiling, the intensity of which can be heightened or diminished at pleasure. It was at first suggested by some of the art critics of the French press that the light so introduced was not brilliant—that it produced the effect of imperfect sunlight during an eclipse—in short, that the new system was less advantageous than the old ones. Further experience has, however, proved its triumphant success, both in an artistic and sanitary point of view, insomuch that it is now determined to light the Theatre Lyrique in the same manner, and a Viennese architect visiting Paris, who has seen it, has at once advised its adoption in the new theatre now building at Vienna. Not only is the glare of the chandelier, by which the view of the stage from some parts of the house was obscured, effectually removed, but the unwholesome and noxious fumes produced by a number of gas-lights are also got rid of—a most important improvement, which should not be lost sight of in the construction of new theatres—while it is a system that might, with moderate outlay, be applied to all our existing theatres. When the performance begins, the brilliant light of the *salle* is reduced to exactly that point calculated to give just the proper amount of due predominance to the lighting of the stage, without at the same time leaving too little light in the house, upon which the full power of light is again thrown between the acts, during which intervals the interest of the toilet, &c., is supposed to be in the ascendant.

OXYGEN GAS FOR FEVERS.—Oxygen gas has been used in the hospitals at Danville, Ky., in the treatment of typhoid fever, and it is said with much success. It is given by inhalation, and several remarkable cures are said to have been made by it. Dr. Shumard, the Medical Director, states that three patients who had been pronounced hopeless by their attending physicians have been cured. Before giving the gas the pulse was low and the body chilly, but after the gas was administered, warmth slowly returned to the extremities, the pulse increased its volume; delirium, which had existed, disappeared, and the involuntary discharges of the bowels ceased. The gas was given in the form of nitrous oxide (laughing gas), and was made from nitrate of ammonia, by Prof. Brickford, of Danville. For want of better vessels it was administered from bladders. Dr. Shumard says, in reference to the gas used: "Although oxygen was employed in these cases in the form of nitrous oxide gas, I would not propose to use it so in all cases. In cholera and severe cases of congestive chill, I am persuaded that oxygen gas, in its pure form, or slightly diluted with atmospheric air, would be better; nor would I hesitate to give it in any form of disease in which the vital powers are depressed, since the cases recorded show that it relieves delirium and irritation instead of producing them."

MARINE ARTILLERY.—Col. Howard has partially recovered from his severe illness, and has driven out once or twice. He is anxious to get back to his command, as soon as he has purchased a gun-boat, in place of the "Picket," blown up.

LEGAL RECORD.

THE STRIKE AT THE GAS-WORKS.

Action for False Imprisonment—Marine Court—Before Hon. Judge Alker and a Jury.

Dec. 15th, 1862.—*Thos. Morris* vs. *William Combe, Superintendent of the Manhattan Gas Company.*—The plaintiff in this case was a fireman in the gas company of which the defendant is superintendent. It appears that the workmen, to the number of about one hundred, held meetings to urge the necessity of an increase of wages; that on the 17th November last, plaintiff, with other employees, went to the office to receive his wages, and found there a large posse of the Metropolitan police. On his name being called, the police said, "Is this Tom Morris?" The defendant (Combe), it was alleged, gave a significant nod of the head, and thereupon the plaintiff, to use his own terms, was "grabbed and put in irons, and taken to the police station, through the public streets, handcuffed to another man." He was kept there all night; no charge was made against him, and he was bailed by a friend in the morning. The plaintiff asserts that there was no warrant against him to his knowledge; that he committed no violence, and did no wrong, and that no complaint has been made against him from that time to the present day. He had obtained employment at the gas-works in Williamsburg, but in consequence of his illegal detention in the police station, he lost the engagement.

The defendant denied that he caused the arrest, or that he nodded his head when the plaintiff's name was called. He also insinuates that Morris must have been arrested for something else.

After the discharge of quivers full of legal arrows between Mr. Edwin James, on the part of the plaintiff, and Mr. John Anthon, for the defendant, the Judge addressed the jury, who brought in a verdict for Mr. Morris for $75.

NEW INFLAMMABLE GAS.—At a late meeting of the London Chemical Society, Mr. Parrett stated that some time ago, while MM. Buff and Wöhler were making some experiments upon electrolytic decomposition, they employed a plate of the metal aluminium as the negative terminal of the battery for the decomposition of water; and as soon as the electric current was established, they were surprised to find that, instead of pure hydrogen gas being evolved, as is usual with a platinum plate, a gas was evolved which inflamed spontaneously. Upon investigation, this gas was found to be composed of hydrogen and silicium, the latter being an impurity in the aluminum plate. Several processes have recently been adopted for preparing this gas. Silicated hydrogen and the silicate of magnesium were found to furnish the best materials for producing it. Dr. Hoffman recommends the following mode of making it: Take 80 parts of fused chloride of magnesium, 70 parts of silico-fluoride of potassium, 40 parts of sodium cut into small pieces, and 20 parts each of the chloride of potassium, and sodium. These ingredients are mixed together dry, placed in a clay crucible, and quickly heated to redness. The product thus obtained is a silicide of magnesium (Mg^2 Si.). When this is triturated in a mortar with hydrochloric (muriatic) acid, it gives off an abundance of gas, which keeps up a lively combustion in the mortar. A bottleful of this gas prepared by Dr. Hoffman, was let off by a tube through a trough containing dilute hydrochloric acid, and as it escaped in bubbles at the surface of the liquid, these inflamed immediately and spontaneously when they came in contact with the atmosphere. Each bubble produced a white flame, like that of phosphoreted hydrogen. The combustion formed flakes of silica, which resembled fumes of burning zinc. This is one of the most dangerous gases, and further investigation may prove that many mysterious fires, directly attributed to spontaneous combustion, may be due to it. Dr. Hoffman believes it is a marsh gas of the silicon series.

COKE BY THE SMALL MEASURE.—A consumer of this species of fuel suggests that there has always been a ntaural affinity between *Coke* and *Little-ton*. They are always quoted together to the clients of the legal profession, and, he adds sarcastically, they always go together to the clients of gas companies. How that is, we really know not.

CORRESPONDENCE.

COMPARATIVE CHEAPNESS OF PETROLEUM AND COAL-GAS.

New York, December 20, 1862.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

In the JOURNAL for December 15, I observe an article copied from the *Journal of the Board of Arts for Upper Canada*, in which the comparative merits of petroleum and coal-gas are discussed in a manner which demands some attention from engineers who desire to know the truth, and who are really anxious to be informed as to the facts of the case. In the article in question the writer is so carried away with his prejudice in favor of petroleum gas that his views must be taken *cum grano salis*, and unless his assumptions be proved by figures, they must be allowed to go by with but a passing attention, and be ranked with other statements of a similar nature. In fact a candid review of the article alluded to must impress the reader that however ingenious it may be regarded as a piece of special pleading in favor of petroleum gas, yet, the impartial judgment of a searcher after truth must condemn the arguments used, and the conclusions drawn from premises so utterly unsupported by proof.

In the first place, after describing the works at Homer and Courtlandt, the writer starts out on the broad basis that petroleum gas possesses several times more illuminating power than coal gas; but with a parade of affected fairness, he "assumes" that "the illuminating power of petroleum-gas is only three times that of coal gas." Now, coal-gas such as we are accustomed to burn in the city of New York, may be set down as 16 candle gas; and this I do not merely "assume," but am prepared to verify it by figures from official sources where the fact will be made plain. Now, on the writer's assumption that "the illuminating power of petroleum-gas is only three times that of coal-gas," has he the temerity to assert that petroleum-gas is made, or can be made of 48 candle power? If so, and he surely does say so in effect, I deny his statement and pronounce it contrary to fact. The best and purest petroleum-gas which has come within my knowledge is of but 40 candle power, and this gas was made from petroleum *alone*, without the use of any water-gas or other diluent. That pure petroleum-gas can be made to give a light equal to 40 candles, is a matter of fact and not of speculation; but in this case when the gas is well made, and thoroughly condensed and purified, the yield is but 60 cubic feet per gallon; or, in other words, it requires $16\frac{66}{100}$ gallons of petroleum to make one thousand cubic feet of gas, (of 40 candle power) or $51\frac{45}{100}$ per cent. more petroleum than the quantity said to have been used in the mean of the two experiments at Homer. This increase of over 51 per cent. in the raw material is a snug little error to begin with.

Passing by the remarks in reference to the saving in time and labor in the use of petroleum instead of coal in gas making, as being foreign to our present investigation, in the words of the writer of the article I "proceed now to the question of cost"—a question, which, let me remark by the way, is frequently a terrible bugbear to advocates of new processes, who, after vain attempts to get round the obstinate figures standing in the way, often make a bold leap and try to jump over them altogether. Let me first quote from the article the following:

"Assuming that two benches, each containing two retorts, are used for making petroleum and coal gas respectively. The cost of apparatus in the first instance is about the same. The time for heating and the fuel consumed is the same. The cost of 11 gallons of petroleum (or 1,000 feet of petroleum gas) at 6 cents a gallon (the price in Toronto) is 66 cents. The cost of 250 lbs. of coal (or 1,000 feet of coal gas,) at $5 a ton, is 62½ cents. But 1,000 feet of petroleum-gas is, at the lowest estimate, equal to 3,000 feet of coal-gas. Hence, the cost of 3,000 feet of coal gas (equal to 1,000 feet of petroleum-gas) or 750 lbs. of coal, at $5 a ton, is $1.87½. Then there is the coke to be deducted from the price of the coal used in making 3,000 feet of gas, which may fairly be set against the smaller amount of labor required in handling the petroleum, when compared with the handling of the coal.

Where petroleum is 10 cents a gallon, and coal $6 a ton, the proportionate cost of the raw materials used will be as follows:

Cost of 1,000 feet of petroleum-gas	$1 10
" 3,000 feet of coal-gas	2 25

The foregoing comparisons refer to the original cost of the material from which the gases are made, but if we take the price actually charged by gas companies into consideration, the results are the more striking."

I have above said that the richest petroleum-gas is but 40 candle power, or 2½ times that of coal gas; and further, that it requires $16\frac{66}{100}$ gallons of petroleum to make one thousand cubic feet of this (40 candle) gas. A new version of the above extract, "revised and corrected," would read as follows:

The cost of $16\frac{66}{100}$ gallons of petroleum (or 1,000 feet of petroleum-gas) at 40 cents a gallon (the price in New York, Dec. 20,) is $6.66. The cost of 250 lbs. of coal (or 1,000 feet of coal-gas) @ 5 a ton is 62½ cents. But 1,000 feet of petroleum-gas is, at the lowest estimate, equal to 2,500 feet of coal-gas. Hence, the cost of 2,500 feet of coal-gas (equal to 1,000 feet of petroleum-gas) or 625 lbs. of coal at $5 a ton, is $1.56.

Again, I quote from the article as follows:

"The cost of private works to supply 200 burners will be about $1,000; the labor of one man per diem; lime for purifying; three bushels of coke at 10 cents a bushel; so that the entire cost will be—

Interest on capital at 8 per cent per ann.	$80 00
Labor at $1 per day	365 00
Lime for purifying, 200 bushels per ann. at 20 cents a bushel	40 00
Petroleum to produce gas for 200 one-foot burners, 5 hours a day throughout the year (365,000 feet of gas); 4,015 gallons, at 6 cents a gallon	240 90
Fuel, say 4 bushels of coke a day, at 10 cents a bushel	146 00
Total cost	$871 90

The equivalent of 365,000 cubic feet of petroleum-gas in coal-gas is 1,095,000, reckoning one foot of petroleum-gas equal to three feet only of coal-gas.

Cost of 1,095,000 cubic feet of coal-gas, at $2 50 per 1,000 feet (a low price in the United States and Canada)	$2,737 50
Difference per annum in favor of petroleum-gas	1,865 60

If the price of petroleum is 10 cents a gallon, instead of 6 cents, the difference in favor of the gas will be, per annum, $1,705.

Thus:

Interest on capital	$80 00
Labor	365 00
Lime	40 00
Petroleum	401 50
Coke	146 00
	$1,032 50
1,095,000 c. ft. coal-gas, at $2 50 per 1,000,	$2,737 50
Diff. in favor of petroleum-gas, per annum,	1,705 00"

However such figures as these may do for a Canadian latitude, they will not answer for the United States, where the price of petroleum is much higher and subject to greater fluctuations. According to present prices of crude petroleum, and according to the correct standard that one foot of *pure undiluted* petroleum-gas is equal to two and a half feet of coal-gas, and that it takes $16\frac{66}{100}$ gallons of petroleum to make one thousand feet of this gas, the tabular statement would read thus:

Interest on capital at 8 per cent. per ann.	$80 00
Labor at $1 per day	365 00
Petroleum, to produce gas for 200 one-foot burners, 5 hours a day throughout the year (365,000 feet of gas) $6,080\frac{80}{100}$ gallons at 40 cents a gallon (which is the price ruling in New York at the time of writing this, viz., Dec. 20, 1862)	2,432 36
Fuel, say 4 bushels of coke a day at 10 cents a bushel	146 00
Total cost	$3,023 36

The equivalent of 365,000 cubic feet of petroleum gas in coal-gas is 912,500, reckoning one foot of petroleum-gas (40 candle gas) equal to *two and a half* feet only of coal-gas,

Cost of 912,500 cubic feet of coal-gas at $2.50 per 1000 feet	$2,221 25
Difference per annum *in favor of* COAL-GAS.	$742 11

My figures, it will be seen, are *slightly* different from those of the writer. I venture to say that any experienced gas engineer, *untrammelled by interested considerations*, will confirm my figures at the expense of those of this champion of petroleum and water gas.

But it may be said in extenuation of the writer's figures, that they were intended for the place from which they emanated, where petroleum is lower than here. Not at all: no limit is set to them, and although the writer bases his calculations upon Canadian figures, yet he refers to gas-works in villages in this State, implying that petroleum can be put there at the same prices.

It may also be argued that the present price of petroleum is much higher than it was but a few weeks ago, and that it is hardly fair to take figures which are so much above the average market price during several months past. I readily admit that prices are high, but I assert also that they are uncertain and liable to fluctuate at any time. Can any advocate of the use of petroleum for gas making put his finger on any quotation and show where one price has been maintained, during the past year, for more than two or three weeks without change? It has been sold, I am aware, as low as 8¼ cents per gallon in New York, while but a week ago it was sold as high as 50 cents. Since then it has receded, but who can tell what figure it may touch in the next two or three weeks? A destructive fire; an ice freshet; speculation, or many other occurrences may cause prices suddenly to advance, and then where would be the position of a gas company depending on petroleum alone as a source of gas?

In these remarks I wish it to be distinctly understood that I refer to the use of petroleum *alone*. When it is used with other substances, such as wood, for example, of course there are considerations to be taken into account which may alter calculations materially.

A great deal might be said in reference to the random statements which are so frequently made respecting the illuminating power of gas. The article under consideration contains specimens of this vicious system of comparison. What is the "assumption" of the writer relative to the illuminating power of petroleum gas but guess-work? Had he carefully and properly made a photometrical examination of the gas, with all the exactness indispensable to such an investigation, he would hardly have made such an unfounded assertion as that petroleum gas such as that described is equal in illuminating power to three times the quantity of coal-gas. A great many superintendents and managers of gas-works are open to this charge of guessing at the illuminating power of gas, and regulating their operations by this unsatisfactory and unreliable basis. Such statements are the veriest folly, for it is impossible for any one, no matter how experienced, to judge of the illuminating power of a gas flame by the eye alone, unassisted by the only apparatus capable of determining the question. Even when a complete photometrical apparatus is possessed, and all appliances are at hand to test the illuminating power of gas, the manipulations are frequently so clumsily performed, and the observations so carelessly made, that the results are worthy of little credence. This unsatisfactory manner of testing, I regret to say, obtains to a considerable extent even among gas engineers who should know better, and who, if they would take the trouble, might become experts in photometry. Consequent upon this state of affairs, it is a palpable fact, that very few photometrical observers perform their tests with unerring accuracy, and their results often vary. I merely mention this, not in disparagement of the science of photometry, for it is a branch of science of great importance, but to show the labor required and the great care necessary to obtain exact results. In this view of the case, what utter folly it is for any one to express opinions of the illuminating power of a gas-flame when judged by the eye alone! I question very much, whether there is such a thing as a photometer at Homer. If there is, and if it had been properly used, we should have heard no such nonsense as that the gas there is of so marvellous a degree of luminosity.

But I must conclude my comments by referring to another remarkable statement, which is rather hastily glossed over near the close of the article. And here I will employ the writer's own words to describe the remarkable theory of the process used at Homer.

"The use of water in the process by which the result, described in the preceding pages, is produced, is for the purpose of converting the volatile hydrocarbon vapors of petroleum into permanent gases. It is thrown into its spheroidal condition the moment it strikes the interior of the retort, and in this state its spheroids continually develope steam of very high temperature and great reducing power. The rich petroleum gas may be largely diluted by the formation of the so-called water-gas, but this has been shown to be an expensive process, and it is far more economical to employ a one-foot burner with a highly luminous gas than a three or four-feet burner with a diluted gas. The use of water-gas as a diluent for rich hydrocarbon gases, which will burn without smoke or smell, and

give a brilliant light from a small burner, is of not only very questionable economy, but it is thought by some to be a dangerous expedient, on account of the admixture of poisonous carbonic oxide into the gas, which, if leakage should by any accident occur in dwelling-houses, might be followed by those fatal results to human life which have occurred time and again in every country where coal-gas is manufactured, and particularly where water-gas is used either with hydrocarbons or in any other form. Water-gas, in order to be economical, implies the conversion of the carbonic acid produced into carbonic oxide, the one being a feeble illuminator, the other not only an incombustible, but so prejudicial to illumination that one per cent. of carbonic acid in coal-gas diminishes its illuminating power by 6 per cent. The use of water-gas has been interdicted by several European governments, on account of the poisonous properties of the carbonic oxide it contains. In the petroleum process, only so much water is used as will ensure the conversion of the volatile hydrocarbon vapors into permanent gases by their reduction to a lower hydrocarbon condition; and an analysis of its constituents shows that it contains much less carbonic acid than common coal-gas. Its great illuminating power is derived from a very large percentage of olefiant gas, together with carbonetted hydrogen."

What is to be understood from such twaddle as this? We are deliberately told that water is used, and yet the idea of water-gas is disclaimed with great earnestness, and its evil tendencies emphatically dwelt on. What is meant by this wonderful "reducing power" of "steam of very high temperature," developed by "spheroids?" Why is not the writer more explicit on this point? Does he think that his readers have so little knowledge of chemistry as to take for granted any assertion he may make without reflecting on the *rationale* of it? If so, the sooner he is informed of his mistake the better. But I am inclined to think that the writer must know that the less said on the subject of the "spheroidal" theory, the fewer will be the criticisms upon it.

When water is used in the manufacture of gas, it is either decomposed or it is not. In the latter case it is merely vaporized and condensed again on passing out of the retort, and as it only abstracts heat without performing any useful or economical office, not a single argument can be used in favor of its employment. In this undecomposed state it has no chemical action whatever, and the only "reducing power" it exerts is to reduce the temperature of the retorts, which our writer acknowledges was done in one of the experiments at Homer. I award to water a *decided* "reducing power" of this kind. In the other case where water is used, it is decomposed, and chemistry teaches us that in order to effect this decomposition at a red heat, some substance must be present having such an affinity for the oxygen of the water as to abstract it from its combination and liberate the hydrogen. This rule is as unalterable as the laws of the Medes and Persians. In the gas-works at Homer, (I quote from the writer's own description of the apparatus) "each retort is divided into three chambers, called the petroleum, the water, and the coke chambers respectively. Petroleum and water are introduced in continuous streams," &c. Now, what action ensues on the introduction of water or steam into a heated retort, where one chamber is filled with incandescent coke? The veriest tyro in chemistry will answer that the water is wholly or partly decomposed, and a mixture of hydrogen, carbonic oxide and carbonic acid gases is the result. Whether the nascent hydrogen thus liberated may "reduce" the rich hydrocarbon vapors to "a lower hydrocarbon condition," or whether it forms a mere mechanical mixture with the vapors and gases distilled from the petroleum, is still a mooted point, and one which I do not propose to trench upon. But whatever becomes of the hydrogen, how does the writer account for the disposal of the carbonic oxide and acid? A perusal of his article will not throw the slightest light upon it; and we are left to grope our way entirely in the dark in an article pretending to enlighten us as to the theory of a process for generating light! This is, to say the least of it, a strange inconsistency! But these gases must be disposed of somehow; and we have, therefore, the only alternative of following the teachings of chemistry, and ascertaining for ourselves what our instructor has failed to show. When the vapor of water first passes into a body of incandescent coke or charcoal, it is at once decomposed; the oxygen seizing its proper proportion of carbon, forms carbonic acid, while the hydrogen passes on in a free state. When the carbonic acid so formed is compelled to pass through any considerable body of incandescent coke, it gives up one equivalent of its oxygen to the carbon, and becomes partially or wholly converted into carbonic oxide. This gas resists the affinities of all purifying materials commonly employed, and consequently it passes on to the gas-holder, along with the other gases, and thence it is distributed to the consumer. This is the gas which the writer of the article denominates "poisonous carbonic oxide," and declares its use to be a "dangerous expedient," and that in the event of leakage in dwelling-houses "it might be followed by those fatal results to human life which have occurred time and again in every country where coal-gas is manufactured, and *particularly where water-gas is used, either with hydrocarbons or in any other form!*" I think I have shown that the gas manufactured by the process so highly commended by the writer must contain a large proportion of this "poisonous carbonic oxide," in which event his own words condemn it, and declare it to be dangerous to human life.

In contradiction of this view, it may be said that the oxygen of the water unites with the carbon of the coke in such a manner as to form carbonic acid only, and not carbonic oxide. This cannot be, for a large part of oxygen is united to carbon in the form of carbonic oxide; but were we to admit that any quantity of carbonic acid were formed, another part of the writer's article would seem to set this admission at naught, for he says, in speaking of the advantages of this gas, that "the quantity of lime required for purifying is not so great by one half," (i. e. as coal-gas requires,) and it is well known that carbonic acid requires a considerable quantity of lime to abstract it from gas, as the writer himself shows a little further on when speaking of the water-gas processes of White and Gillard.

But, suppose the carbonic acid be not removed, since we have seen how expensive this part of the process must be from the large amount of lime necessary for the purpose, and suppose it be allowed to pass on to the gas-holder, and thence distributed to consumers. Here again the writer's own words suggest this to be impossible; for does he not say that "one per cent. of carbonic acid in coal-gas diminishes its illuminating power by 6 per cent.," and does he not claim an extraordinary illuminating power for this gas? This supposition, therefore, must fall to the ground for want of proper encouragement.

It is very clear, from what has been shown, that the process described by the writer of the article from which I have quoted, is a *petroleum and water-gas* process, and no mincing of words will be availing in inducing any other opinion of it. The writer speaks of this process in terms of high commendation, and yet deals it a stab in the dark by virtually asserting that it is a water-gas process, while striving to imply that it is not. Water-gas, he says, is an "expensive process" of "very questionable economy;" it "is thought by some to be a dangerous expedient" on account of its "poisonous carbonic oxide," and it "might be followed by those fatal results to human life." These are admissions of a very damaging character, but what reflecting reader can peruse the article and not see that they are made by the writer himself? I have not made them, nor do I assert them to be true, but merely show that the writer, in his blind zeal and devotion to the process described, has "let the cat out of the bag," and has produced a paper which, to the mind of an adept in gas matters is a bundle of inconsistencies and contradictions. Whether water is used as cold water, or in the form of steam—superheated or otherwise—or in a "spheroidal" condition, there is one and *only* one manner in which it is decomposed by incandescent carbonaceous matter. The writer of the article, if a chemist, must acknowledge this; if not acquainted with chemistry, before attempting to instruct the public in gas matters, I would respectfully suggest that he pay some little attention to the rudiments of that important, but much neglected science.

In my comments upon the lucubrations of this Canadian philosopher, I have studiously refrained from condemning his pet process. As an advocate of coal-gas, and believing it to be decidedly cheaper than petroleum-gas, (unless in certain situations,) I have shown the fallacy of his figures, because, had a statement abounding in such glaring errors remained uncontradicted, it might have been productive of much loss to some engineers, who, taking it for granted, would have been disposed to avail themselves of so inexpensive a process as this was said to be. I have merely corrected the "assumption" of the author relative to the illuminating power of the gas; I have shown that when 40 candle gas is produced, it requires $16\frac{66}{100}$ gallons of petroleum, instead of eleven gallons, as alleged, to generate 1,000 cubic feet; I have also shown that at this time petroleum is worth 40 cents instead of 6 cents per gallon: that 40 candle petroleum-gas is but $2\frac{1}{2}$ times greater in illuminating power than coal-gas; and that at present prices of coal-gas in this city, even with the companies' profits thrown into the bargain, *coal-gas is cheaper than gas made from petroleum alone.* So far I have controverted the author's views; and I would merely suggest that in future should he attempt to describe the cost of a new process, it would be advisable for him to affix the little abbreviations "E. & O. E."

As far as the theory of this process is concerned, the writer's own explanation of it, or rather, lack of explanation, throws it open to criticism. It may be a good process for some localities, but why is the most important part of it glossed over in so hasty a manner? Why is it so described that the most verdant novice would readily recognize it as a water-gas process, and yet the idea of water-gas disclaimed as a noisome and dangerous expedient? Why are the objections to water-gas dwelt upon with such emphasis? Echo answers—Why?

AN ADVOCATE OF COAL-GAS.

PROPOSED SUBSTITUTE FOR COAL-GAS.—In London, England, an invention of a Mr. Mongruel, of France, has been lately exhibited. This invention which its originator calls "making gas from air," is nothing more than the old idea of carburetting air revived. In operating it, common atmospheric air is forced through a pipe, and through a vessel containing a liquid hydrocarbon, such as naphtha or other volatile substance, although the inventor wishes to mystify the process and to infer that another substance is used. The air passes from the hydrocarbon vessel to the burners and gives a light "which is said to be cheaper by 25 per cent. than ordinary gas-light, though more vivid."

The London *Builder* speaking of this invention, says:

"Strictly speaking, this light is not an air light at all, but a very ingenious and elegant way of burning paraffine, or camphene, or some such hydrocarbonaceous liquid in the state of vapor. The air is mainly as it were the wick of the lamp or burner, charged with the hydrocarbon; and on a small scale, or where the carburator is placed near the burner, as in the exhibited instance, such a light may work well in practice: but were the air charged with the vapor at any distance from the burner, we should fear that the pipes would soon get filled with reliquified vapor, while the carburated air was materially deteriorated. We do not see, however, why "air-works" might not be erected on a large scale with mains and service-pipes, while the carburator, like the meter, might be kept on the premises supplied. A compressed air company might make this a profitable branch of their business."

A company *might* make it profitable, but it is barely possible. Carburetted air-lights on a practical scale have always proved a failure, and we do not see why this should be any exception to the general rule. Between the danger of explosion, of the pipes becoming clogged up with the condensed hydrocarbon, and the light going out by way of variety, the verdant consumer adopting such a light would not have much quiet.

DUBLIN, IRELAND, WATER-WORKS.—The Lord Lieutenant of Ireland has recently laid the foundation stone of a new resirvoir for the Dublin water-works at Stillorgan.

EARTH-WORKS AND WATER-WORKS.—The sailors say if the things land-lubbers fight in are called earth-works, they don't see why a jolly old man-o'-war can't be called water-works. Good logic, and no objections to it.

THE AMERICAN GAS-LIGHT JOURNAL is published on the 1st and 15th of every month, and is the recognized official organ of

LIGHT, HEAT, WATER-SUPPLY AND SEWERAGE.

Its purpose is to ascertain and make known all new discoveries in the science and economical application of LIGHT, and promote thereby the interests of companies and consumers; to encourage and aid the introduction of PURE WATER from Lakes and Rivers into Towns and Cities, and to improve the system of SEWERAGE, VENTILATION, HEATING, and DRAINAGE everywhere.

THERE ARE 20,000 CITIES AND TOWNS IN THE UNITED STATES, CAPABLE OF SUPPORTING GAS-WORKS, WHILE THERE ARE NOT 400 GAS-WORKS IN OPERATION IN THE WHOLE COUNTRY!!!

TERMS—CASH IN ADVANCE.

SUBSCRIPTION—In the U. S. and British Provinces. $3 per annum.
ADVERTISEMENTS—According to position and space occupied. For particulars of which please address the Advertising Agent, F. W. BOND.

☞ Remittances by mail to be addressed to the Editor,
C. ELTON BUCK,
ROOMS of the AMERICAN GAS-LIGHT JOURNAL,
No. 39 Nassau st., cor. of Liberty st., opposite the Post-Office.
New York City.

AGENTS OF THE AMERICAN GAS-LIGHT JOURNAL.

FOREIGN.

Germany .....B. WESTERMAN & Co., of New York.
Great Britain....TRUBNER & Co., 60 Paternoster Row, London, where single copies may always be found,
Paris, France. . . { LE JOURNAL DE L'ECLAIRAGE AU GAZ, 25 Boulevard Poissonnière.

DOMESTIC.

V. HAROLD MYERS, No. 152 South Fourth st., Philadelphia.
The AMERICAN GAS-LIGHT JOURNAL can be purchased of all the newspaper and periodical dealers in the U. States and Canadas.

THE
AMERICAN GAS-LIGHT JOURNAL,
PUBLISHED ON 1ST AND 15TH OF EVERY MONTH.

C. ELTON BUCK, ... EDITOR.

THURSDAY, JANUARY 1, 1863.

A retrospect of the year which has just closed, fruitful as it has been with the gravest incidents of a political nature to our country, does not suggest the occurrence of any remarkable events connected with those subjects which claim our particular attention. We have endeavored in our periodical notes and jottings to present a faithful record of all matters of interest to those connected with the specialities to which the JOURNAL is devoted, and particularly to spread before our readers reliable intelligence concerning the progress of gas-lighting both at home and abroad. How well this task has been fulfilled it is not for us to say: but it is with no small satisfaction that we acknowledge many evidences of appreciation on the part of subscribers, and, notwithstanding the unpropitious character of the times, we are happy to say the number of our patrons is gradually and steadily increasing.

During the twelve months which have just elapsed, a number of gas-works have been erected, and are now in successful operation, while others are about being constructed. This is the more remarkable when the extreme cheapness of kerosene oil is taken into account, and the many inducements which it holds out to the poorer classes as an economical illuminating agent. We hear of still other works being projected, and the probability is that the new year will witness the addition of a number of establishments to those already in operation. Gas-lighting in this country has as yet received no "check," which our sagacious and amiable British contemporary predicted it would a short time ago, in the event of the excise bill becoming a law. This bill, which was regarded as such an incubus to gas-light companies, is now in operation, and nearly every company in the country will pay their own tax, and some of them, notwithstanding this burden, have made liberal reductions in price.

Inventors have not been idle during the past year. A glance at the lists of patents which we have published, embracing all inventions connected with our specialities, will show several new processes connected with the production of gas, while, in respect to apparatus used in its manufacture, the new contrivances have been almost innumerable. We have had new retorts, valves, meters, burners, compensators, and regulators, and in these new designs the ingenuity of the inventors seems to have been taxed to the utmost to produce something which might be regarded as an improvement upon old ideas. So far we have heard of no great revolutions caused by the adoption of new apparatus, nor have we been advised of any changes in the usual routine of operations in any of our large gas-works.

In the improved processes for the manufacture of gas, the use of petroleum has been connected with nearly all the new inventions. The interest excited by this substance among gas engineers has been widely felt, and innumerable essays have been made to ascertain its value as a raw material in gas making. The early experiments which were made—shortly after the discovery of the immense quantity of petroleum raised in Pennsylvania and Canada—were not satisfactory, upon the whole, in convincing engineers that the new substance possessed the indispensable quality of cheapness, so as to induce more extended investigations into its fitness for gas making in the stead of coal. Since then, during last summer particularly, the prices of petroleum declined to so low a figure that the hopes of these early experimenters began to revive, and they renewed their investigations with a determination to ascertain the truth. As yet no large gas-works have adopted petroleum, nor do we believe they will ever see their way clear in so doing. A few small village works have made trial of it, but we apprehend with only questionable success, unless used in conjunction with other substances yielding by their carbonization, a sufficient amount of hydrogen and light carburetted hydrogen to dilute the richer gases and hydrocarbon vapors formed from petroleum. The village works where petroleum has been adopted, have been principally those heretofore using rosin—the price of which now places it entirely out of the category of gas producing substances.

A correspondent in another column controverts the opinions set forth in an article which we copied from an exchange in our last issue, in which petroleum was declared to be far cheaper than coal, and superior to it in every way for generating gas. The recent fluctuations in the price of petroleum render it very difficult to decide upon a given figure, upon which to base calculations respecting the comparative cheapness of petroleum and coal-gas. A sudden advance or decline may upset all inferences from given rates, and thus, until the supply and demand become more closely approximated and continue so, no reliable calculations can be made. As the matter now is, it is very much a question of locality. A town situated in the neighborhood of the oil wells, might be lighted profitably with petroleum-gas, or rather with the heavy oil remaining after a preliminary distillation, after the "light ends" have been removed. These subtile vapors, which are volatile at low temperatures, unless previously removed, will cause engineers some trouble. Escaping from the condenser and partly passing out from the gas-holder, they seem to have a very provoking aptitude for clogging up pipes and fittings, and this propensity is very much at variance with the wishes of both companies and consumers. The coming year will witness the full solution of the question whether petroleum-gas will become a "fixed fact," or whether it will vanish from the sphere of observation with the comet-like suddenness of its appearance.

In another column may be found the verdict of the Marine Court in the suit of one of the rioters at the Manhattan Gas-Works for false imprisonment. We confess we do not see the justice of this decision. The workmen have an undoubted right to strike or combine peaceably and demand in a proper manner higher wages. The company has an equal right to accede to the demand, and to discharge and employ laborers at pleasure. The latter have no right to obstruct the company in the prosecution of their business, nor in seeking other workmen; and in the present case we regard the conduct of the plaintiff in this suit as entirely in the wrong, and the verdict of the jury untenable on appeal. The company owe it to themselves and the community to carry up the case, and establish their right to select their own laborers and protect their property.

HAPPY NEW YEAR!

The Editor and Proprietor of the AMERICAN GAS-LIGHT JOURNAL wish a Happy New Year to all their friends—and enemies. They commence the new year on terms of peace with all men. Having no ulterior or selfish objects in view, they present a clean record of their past actions, and an honest intention for the future. Their foreign relations, which looked a little squally a month or so ago, have subsided into a dead calm, their British assailant having relapsed into a leaden slumber, something like that of the anaconda, who requires a month to digest what it took but an hour to swallow.

OUR CRITICISMS ON THE GAS COMPANIES.—The most unmistakeable evidence of good feeling on the part of the New York city gas-light companies towards us is exhibited, notwithstanding a little individual pettishness of two or three large stockholders, who may get over it at their leisure.

By the outside public it is observed that the companies have a friend and an ally in the AMERICAN GAS-LIGHT JOURNAL, which, while it has the independence to criticize their errors, has also the courage to defend their rights.

We have no idea of hearing in silence a hue-and-cry against the gas companies. We are their natural ally, and shall defend and promote, to our best and disinterested ability, their true interests against every one of their enemies, within and without.

WATER METERS AGAIN—MORE TESTIMONY IN THEIR FAVOR.—We have just received the report of the Board of Water Commissioners of Jersey City, N. J. In a future number we will refer to it more at length. At present we merely make the following extract, which adds additional testimony to the value of the water-meter:

"The system of meter measurement, to consumers of large amounts of water, has been in operation during the year. Its success is shown both in the large amount of water saved and in the increased revenue from this class of consumers. The low rate at which the water is furnished by meter (1 cent per 100 gallons,) together with the certainty of the amount used, has overcome the opposition which was at first experienced, and most of the opponents of the plan have become, after a fair trial of the system, its warmest advocates. The successful results of the plan I consider in a great measure owing to the efficient and reliable meter used. Of the 100 meters furnished by Mr. H. R. Worthington, of New York, and in operation on our works for the past year, but two or three have required repair. In these cases the meters were placed in positions where large amounts of water were required to be rapidly supplied, and were subjected to a greater duty than was appropriate to their size; this was remedied by attaching an additional meter to the service, and, by thus dividing the work of each, no difficulty of the kind has been since experienced. The important advantages possessed by this meter, over those heretofore used, consists in its simplicity of construction, the uninterrupted flow in the delivery of water, and its reliability, as tested by its satisfactory operation for the past five years."

These remarks will be concurred in by all companies using reliable water-meters. We have yet to hear the first well-founded complaint against them. In this view of the case it is surprising that so many water companies hesitate to adopt them. However, there is no difficulty in accounting for the blindness of those who persist in standing in their own light.

WESTMORELAND COAL COMPANY.—The Westmoreland Coal Company of Philadelphia have declared a dividend of one dollar per share, payable on and after January 2d. The transfer books of the company are closed until January 5th. The coal mined by the Westmoreland Company is used by many of our gas companies, and is regarded as an excellent article.

OLEO-WATER-GAS.—Attention is called to the advertisement of the "Oleo-Water and Electro-Chemical-Gas Manufacturing Co." in another column.

ANSWERS TO CORRESPONDENTS.

J. B. T., of Ky.—*The original edition was published in this country, but is, we believe, out of print. An English edition has been published. This, with the present price of exchange, would cost you more than twice the price of the American.*

R. C. A., of Ohio.—*The difficulty you complain of is experienced in many gas-works. The cause of the deposition of carbon is that too great pressure is maintained on the retorts. When the gas is removed as fast as generated very little carbon is deposited. You should procure an exhauster, and we are confident you would find the use of this instrument would amply repay the money laid out in its purchase. The substance like "putty" must be naphtholine, which would seem to indicate your gas is not fully condensed. Scrape a little of it off, and send it to us in a letter, and state your difficulties more particularly, and we will take pleasure in assisting in their removal.*

C. E. B., of N. Y.—*It cannot be obtained in this city. You had better send for it through some responsible party.*

J. C. H., of Md.—*We have had no intelligence from the inventor for a long time, but presume he will return shortly, when he will be ready to attend to orders.*

G. H. M., of Mass.—*There is no necessity for purchasing an expensive apparatus. With a few porcelain dishes and glass bottles and tubes, you may extemporize an apparatus which will fully answer the purpose.*

Citizens', Brooklyn, N. Y.—The Citizens' Gas-Light Company, of Brooklyn, have declared a semi-annual dividend of 3 per cent., payable January 15th. This company seem to have reached a position too solid to be disturbed by the hostility of the old company, and we trust, for the sake of the people of Brooklyn, that the rumored negotiations between the two companies will not prove true, and that the new company will not risk the alienation of the popular support. Since the new company went into operation, the price of gas has been reduced more than 100 per cent., with no complaint of poor gas. Keep the two companies in operation, and the people of Brooklyn will always have good light. The Citizens' pay the government tax and charge no rent on meters.

Metropolitan, N. Y.—The amalgamation of this company with the Manhattan is not yet signed, though it may be regarded as a *un fait accompli*. The stock of the Metropolitan is now quoted at 105 per cent., sixty thousand dollars having been sold last week for foreign account at that price. One year ago, fifty per cent. was the quoted value of these shares, owing to the dread of the enmity of the other gas companies in this city. We were at that time taken to task for even mentioning the Metropolitan in our columns, for the simple reason that it was an opposition company. At the same time the old Brooklyn, N. Y., stopped its subscription to this Journal because we encouraged the Citizens', opposition, in that town.

How do we all stand now? The Metropolitan Company's works not yet built, and yet its stock at five per cent. premium, and the Citizens', after two years' business, with its stock approaching in price that of the declining old Brooklyn. The idea that any corporation can check the progress of rivals in these days is simply absurd, while their attempt to silence the Press or punish it by withdrawing their "support," is childish. The press and the people are mutually dependent. We give *quid pro quo* for all we receive, and aside from the personal favors connected with social life, we neither ask nor do we wish any.

A Testy Gas Consumer.—A fellow who does not pay his gas bills complains that his gas has been shut off, whereas he says the company ought to have sued him the same as for any other debt. The company ought to do no such thing. If he does not pay for his gas, shut it off—if he does not pay for his liquor, stop his grog. For such a man the shorter catechism is better reading than the long moral law.

Conshohocken, Pa.—Private gas-works are about being built here, to light the large woolen mills of Messrs. Bullock & Sons. Mains will be extended through some of the streets of the village of Conshohocken, and gas will be sold to those who wish to take it. We understand that the gas will be made from petroleum and will be mixed with atmospheric air.

ARTIFICIAL ILLUMINATION.

Artificial illumination, the economical production and diffusion of which are matters of general interest, is obtained for domestic purposes from such materials as will, by combustion, afford a permanently luminous flame. The term combustion, as usually applied, is a rapid combination of a combustible body with oxygen, with an attendant disengagement of heat and light resulting in the destruction of the burning body and the formation of new compounds. We cannot positively state more in explanation of the causes which lead to this disengagement of heat and light, because the conflict of the various plausible theories leaves a doubt upon the subject. Certain it is, however, that chemical combination is always a source of heat and light; but whether these phenomena of combustion are explicable upon certain changes in the amount of latent heat in bodies entering into combination, or, by Berzelius' theory of its origin, "from the oppositely electrical substances neutralizing one another, in the same manner as the electric equilibrium is restored during the discharge of a Leyden jar," we will leave to the decision of philosophers, as it is not in the author's power to settle this mooted point. *Oxidation* is a species of combustion, but in this process the union with oxygen is not sufficiently rapid to produce a *perceptible* evolution of heat and flame. A body having so great an affinity for oxygen, that its union therewith will be attended by an emission of heat, is called a *combustible*, and the oxygen, or other gas in which it is burned, is styled a supporter of combustion. The evolution of heat is apparently proportional to the amount of oxygen consumed, but varies with the nature of the material. A candle burns much faster in an atmosphere of oxygen than in that of common air, but the increase of heat and light is in a corresponding ratio. That species of oxidation taking place with those bodies which burn with flame, at a heat less than that of redness, is called *low combustion*. Thus, when tallow or oil is thrown upon a heated iron plate, not visibly red hot, it melts and emits a pale lambent flame, only perceptible in the dark. The same occurrence is evident, when a portion of oil is heated in an iron capsule until it catches fire, and the flame then extinguished; the hot oil still continues in a state of low combustion, and is ready for thorough ignition immediately upon the application of an atmosphere of oxygen; and so also a candle recently blown out, although no point of the wick remains red, is, upon the same reasoning, sometimes rekindled in oxygen. Here we have the explanation of the apparently unaccountable causes of frequent fires in storehouses for woolen and other rags more or less imbued with oil. The large surface exposed to the air so facilitates this low combustion, that the oil becomes converted into resin, and the rapid absorption of oxygen producing this change, generates sufficient heat to cause a spontaneous ignition of the combustible. This affinity of combustible bodies for oxygen is active only at high temperatures, and hence, in most cases, it must receive a *start*, if the expression may be used, or, in other words, to commence the combustion, the combustible should be heated to a certain point, but as this degree is far below that emitted during the combustion, it follows that when once ignited, it continues burning until its entire destruction. But it is not meant to convey by the word destruction, the idea of the total loss of the material, or the perfect annihilation of any particle thereof, for this would be contrary to fact; nothing is lost, there being merely a change of state, or a resolution of the solid or liquid bodies into gaseous matter and vapor.

The modes by which artificial light is at present produced are three, viz.: gas, lamps, and candles. The principles upon which their illuminating power is based are identical in each of them. The variation in fatty material and the modification of the burning apparatus are foreign to the theory of combustion, their part and object being only to facilitate its progress, and thus influence the economy of the light. Granting, then, that all the ordinary substances from which we obtain light may be represented by gas and oil, let us proceed to explain the rationale of their combustion, which furnishes us the flame that bears so importantly upon the domestic economy, for without it, to say nothing of the pleasure and convenience it affords, there would be be a loss of that time now vouchsafed to us by these means, and which would otherwise form an incalculable dificit in the life period of mankind.

In the language of Prof. Faraday, let us suppose we have at hand, for the purpose of obtaining light, both oil and olefiant gas. Although wax, tallow, or anything of that sort, be used for the purpose, yet they all fall under one or other of these denominations, inasmuch as they are like the vapor of oil. These are the two substances to which we generally refer the light. The oil contains carbon, hydrogen, and oxygen, and the gas only carbon and hydrogen. The composition of oil, that from the sperm whale for example:

Carbon	78.0
Hydrogen	11.5
Oxygen	10.5

The olefiant gas is that made from coal, and burned in our streets and stores as a means of illumination. Its composition, per cent., is:

Carbon	70.
Hydrogen	30.

Let us suppose that we have these two things represented, one by a vessel containing hydrogen, and the other by a piece of charcoal existing separately, and in their elementary states.

The constituents of the two bodies are given now, but the oxygen present in one of them will be passed by, inasmuch as it merges into the bodies when burning in the air. Consider the hydrogen, which is a very light, gaseous body, as burning; the carbon is ready at hand, and the combination of the two will be explained directly. The charcoal can be burned in the oxygen of the air, or pure oxygen prepared for the purpose. The oxygen of the air is identical with the gaseous oxygen, and these two instances illustrate all the modes in which is burned every one of the combustible substances, either in the ordinary way, or by extraordinary means, for the production of light. Whether we burn the oil or the gas, the same thing happens in all these cases, the same final result takes place as in this particular instance. For example, there are the carbon and hydrogen, combined in the form of gas, and its combustion partakes in its character of the two compounded, viz.: of the flame of the hydrogen, and the luminosity of the carbon, combined in one act.

Now, when these two bodies are burned, as they are in either the oil or gas-lamps, the hydrogen produces water, which is a compound of hydrogen and oxygen, and carbonic acid constituted of carbon ond oxygen, as is proved by receiving the products of the combustion of a lamp into a glass jar, and testing them. But what are the changes in the atmosphere, which, under all these circumstances, is supporting the combustion of the light, and what is it that is thrown into that atmosphere from the oil or gas which is burnt? The oil, by reason of the hydrogen it contains, produces water by the union with that portion of oxygen which it takes from the atmosphere—a fact very easily determinable by holding a glass jar over a jet of ignited hydrogen. The light takes the oxygen from the atmosphere, and forms with it water, which condenses in vapor upon the sides of the vessel. The carbon from the same cause is converted into carbonic acid, a vicious gas, destructive of life and insupportable of combustion, and hence the dimness of light, after a lengthy burning in close apartments, is partially owing to the presence of this body, and partly to a deficiency of oxygen, by reason of the absence of all inlet for fresh air, the source which furnishes it.

The committee of the English House of Commons, having proposed the inquiry as to the relative vitiation of air by the breathing of men and the burning of candles, received from Mr. Ure, one of the chemists to which it was addressed, the following reply:

"Wax contains 81.75 parts of carbon in 100, which generate by combustion 300 parts of carbonic acid gas. Now, since 125 grains of wax constitute the average consumption of a candle per hour, these will generate 375 grains of carbonic acid, equivalent in volume to 800 cubic inches of gas. According to the most exact experiments on respiration, a man of ordinary size discharges from his lungs 1,632 cubic inches of carbonic acid gas per hour, which is very nearly double the quantity produced from the wax candle. Hence

the combustion of two such candles vitiates the air much the same as the breathing of one man. A tallow candle, three or four in the pound, generates nearly the same quantity of carbonic acid as the wax candle; for though tallow contains but 79 per cent. of carbon instead of 81.75, it yet consumes so much faster as thereby to compensate fully for this difference. When a tallow candle of six to the pound is not snuffed, it looses in intensity in thirty minutes, eighty-hundredths, and in thirty-nine minutes, eighty-six-hundredths, in which dim state it remains stationary, yet still consuming nearly the same proportion of tallow. A wax candle attains to its greatest intensity of light when its wick has reached its greatest length, and begins to bend out of the flame. The reason of this difference is, that only the lower part of the wick in the tallow candle is charged with the fat so as to emit luminiferous vapor, while the upper part remains dry; whereas, in the wax candle, the combustible substance being less fusible and volatile, allows a greater length of the wick to be charged by capillary attraction, and of course to admit a longer train of light."

The illuminating power of a candle is greatest as soon after the lighting of the wick, as the fat begins to melt and flow freely; and previous to the crusting of the wick. As soon as the latter condition commences, the intensity of the light diminishes.

All kinds of artificial light are designated by the term terrestial light, in contradistinction to solar light, or that proceeding from the sun. The chemical agency of each is analagous, though the terrestial light is much the feebler of the two. The source of this latter kind of light is the combustion of inflammable matter, the excessive heat, given out during the process of which renders the burning substance luminous. This luminosity increases proportional to the intensity of the heat, and augments from a dull red to one of shining brillancy, and to this incandescence of their material in a gaseous state, are to be attributed the different kinds of flame, for instance of candles and gas-light, serving for the purposes of illumination. In conclusion, therefore, the illuminating power of the coal gas and of oil and candle materials, is due to their consistency of carbon and hydrogen, assisted by the oxygen of the atmosphere, which converts the first into carbonic acid, and the latter into water. It must be remembered, however that temperature is not the sole cause of luminosity in burning bodies; for this property varies with the chemical and physical constitution of bodies—density playing an important part. For example, metals, when heated, emit a vivid light, while gases are scarcely incandescent, when there are no particles of solid carbon suspended in the flame.—*Morfit's Applied Chemistry.*

GAS FOR OLD TRINITY.—The vestry of Trinity Church have decided to introduce gas therein. Up to the present time only candles have been used, which, though shedding a "dim religious light," which is highly ecclesiastical, is not entirely satisfactory. Orders have been sent to Coventry, England, for two standards for the chancel, each to be fourteen feet high, and provided with forty burners. They are to be imported through Mr. Henry M. Congden, an architect of this city. The rest of the church will be lighted by circles of jets around each column, as in St. Paul's Methodist Church in Fourth avenue.

CORN AS FUEL—CORN-GAS.—We learn that the Delzell Steam Mills, at Atlanta, are now run with corn for fuel instead of wood, that article being cheaper and more easily obtained than either wood or coal. We suggest the plan of using *damaged* corn.—*Lincoln, Ill. Jour.*

If corn can be profitably used as fuel in Illinois, why may it not also be employed for making gas? The quantity of oil it contains would make a gas of great illuminating power. We have water-gas, oil-gas, rosin-gas, petroleum-gas, oleo-water-gas, electro-chemical-gas, cotton-seed-gas, &c. Perhaps we may yet hear of corn-gas.

GAS IN ENGLAND.—New gas-works have been built in Botesdale. They were erected by Messrs. Porter & Co., of Lincoln, from plans by and under the superintendence of Mr. Methoyn, of the Bury Gas-Works. The works are situated nearly in the middle of the town.

WATER-WORKS OF WIGAN, ENGLAND.—The engineer of the Wigan Water-Works, in his report, thus refers to the works under his charge:

"The water supply in the town is both abundant in quantity and good in quality, no less than from 500,000 to 600,000 gallons being pumped daily into the town. The water is filtered through sand and charcoal, and is as free from organic impurities as any water supplied in the neighboring towns; in fact, I cannot suggest any improvement in the present supply. The covering of the filtered water-tank answers admirably: the exclusion of light prevents the water from becoming foul, it also excludes smoke and other impurities floating in the atmosphere."

The London *Builder*, from which we copy the above extract, informs us that the water supply for Wigan is drawn from a surface of about 2,400 statute acres. "The river Douglass has been diverted to form a site for the impounding reservoir, which contains about 135,000,000 gallons. The reservoir is formed over the Wigan coal-field, but is said to be perfectly water-tight. The water-works have not been developed to the fullest extent, as there has not been time to put on services. When the district is fully supplied for domestic uses and for trade purposes, and when times are better, the income, it is considered, will pay interest on money borrowed, if not more."

The town of Wigan is situated in Lancashire, the district where so much suffering is now being experienced on account of the cotton famine.

EXPORTS OF COAL TO THE UNITED STATES.—Notwithstanding the commercial depression produced by the American war, it is gratifying to find that the exports of coal from this country to the United States during the first three-quarters of this year have exceeded those of 1860 and 1859. The following are the figures for the first nine months of the last four years: 1859, 172,592 tons; 1860, 249,736 tons; 1861, 300,467 tons; 1862, 252,985 tons. The total export of coals, to all parts of the world (the coasting trade excepted) during the same months, were in 1859, 5,497,081 tons; in 1860, 5,637,152 tons; in 1861, 6,001,616 tons; and in 1862, 6,453,923 tons—so that during the four years, on the three-quarterly periods, there has been an increase of upwards of a million tons.—*London Colliery Guardian.*

THE LIME LIGHT AGAIN.—It is said that Dr. George H. Smith, of Rochester, N. Y., in place of hydrogen employs ordinary coal-gas, and instead of oxygen, atmospheric air, which he states decomposes at the moment of combustion by passing through a suitable burner. The cost of the light, it is said, does not exceed one cent per hour (?). Photographs have been taken by it, and the apparatus is said to be durable and more easily controlled than an oil lamp. The new light is said to be applicable for locomotive head-lights, ships, streets, churches, halls, and private houses.

BENZINE EXPLOSION.—An accident occurred at the Oil Works of Messrs Potter & Blynn, of this place, on Friday night, Nov. 28, which came near resulting seriously, and which will serve as a warning to oil refiners to use the utmost vigilance and care to prevent accidents of a similar nature. The workmen engaged in the refinery were running off a "batch" of oil in the evening, and as one of them was passing round with a lantern in his hand, he approached a little too near a barrel containing light naphtha, which, by some oversight, had not been removed to a safe place. It immediately took fire and exploded, blowing out one head of the barrel and scattering the burning naphtha over the ground for some distance. The fire was soon arrested and no particular damage was done; but had the other end of the barrel blown out, it would, in all human probability, have resulted in the loss of the life of the workman.—*Oil Springs Chronicle.*

HEALTH OF GAS WORKMEN.—The workmen employed in the manufacture of gas are, as a class, remarkably healthy. In the performance of their ordinary duties, many of these men daily inhale considerable quantities of both pure and impure gas; but I have never known an instance in which, in such cases, it has operated injuriously.—*Rutter.*

PATENTS.

UNITED STATES.

37,015.—Orin Sweet and M. E. Hicks, of Providence, R. I., for an Improvement in Packing for Rotary Pumps:

We claim the insertion of these bronze-metal rings into the engine head, and the peculiar mode by means of the cog-wheels, of adjusting the said rings which serve as a packing for the pumps or engines, producing the effect of keeping the pumps or engines water-tight.

37,018.—S. H. Titus, of St. Lousi, Mo., for an Improved Coating for Oil Barrels and Casks:

I claim the solution of gelatine compounded substantially as specified, and its application to the interior of casks and other vessels, in manner and for the purpose substantially as described.

37,024.—H. M. Wyeth, of Bloomfield, Iowa, for an Improvement in Pumps:

I claim the combination of the central division piece, C, with its holes, c and d, and valves, f f, with the other parts of the pump, the whole constructed and arranged for operation substantially as shown and described.

37,032.—R. Chester, of Chicago, Ill., for an Improvement in Signal Lanterns:

I claim the combination and arrangement of the glasses, c d e, (whether set in frames or not), the grooves, C D E, and the cords, r r' g g' and second, the arrangement of the wings, a, with the glass, c, all constructed and operating substantially as and for the purposes delineated and set forth.

37,034.—D. M. Cummings, of Enfield, N. H., for an Improvement in Water Wheels:

I claim the long and short sided buckets, A A A, of my improved water wheel, made substantially as herein described.

I also claim the use of a combined series of long and short sided acute-angled buckets, A A, when arranged within a water way, E, which is furnished with a series of stationary tangential shutes, K K, and with a connected series of movable connecting gates, M M, substantially in the manner and for the purpose herein set forth.

I also claim the arc-shaped open spaces, t t t, which immediately surround my improved water wheel, the said spaces being outwardly bounded by the tangential chutes, K K, and the inner side of the water-way, E, substantially in the manner and for the purpose herein set forth.

36,037.—John Firth and John Ingham, of Phillipsburg, N. J., for an Improved Flask for Cast-iron Pipes:

I claim, first, The combination substantially as set forth of the two halves, A and A', of the flask hinged together, the staples, I, or their equivalents, the flanges a a, and clamps, B B, or their equivalents, for the purpose specified.

Second, The covers, H, of the holes, G, when the said covers are hung to the side of the flask and adapted to projections on the same, in the manner described.

37,047.—J. J. Marcy of Meriden, Conn., for an Improvement in Lamp Burners:

I claim the burner, B, having its tube, c, perforated at its lower end and encompassed by the guard or flanch, f, in combination with the perforated annular flanch or chimney supporter, C, applied to the tube, c, below the deflector or cone, d, all arranged as and for the purpose herein set forth.

37,055.—T. H. Risdon, of Mount Holly, N. J., for an Improvement in Casting Water Wheels:

I claim casting water wheels in one piece, in the manner and by means of a mold or molds, constructed and arranged as described.

37,068.—E. C. Blakeslee (assignor to Holmes, Hooth & Hayden), of Waterbury, Conn., for an Improvement in Lamps:

I claim the bent lever, g, on the fulcrum, 1, and actuated by a spring, as set forth, in combination with the flanged chimney, c, and ring or holder, b, for the purposes and as specified.

37,074.—R. G. Hunt, of New York City, for an Improvement in Wooden Sieves for Gas Purifiers:

I claim a sieve or section of a sieve made from the solid wood by slotting, when the slots are conical in form and so formed at the end as to leave a wider bar at the end on the bottom side, substantially as described and substantially for the purpose hereinbefore set forth.

37,080.—J. M. Hancock, of Philadelphia, Pa., for an Improvement in Coal-oil Lamps:

I claim, first, Any suitable reservoir, D, in which is a tube forming an air passage, the latter being surmounted by a cap, H, and said reservoir having one or two wick tubes, C and C', when the latter are formed and arranged in respect to the opening in the top of the cap, substantially as specified, and when a supply of air is transmitted to the cap, through the aforesaid tube by the agency of a supplementary lamp.

Second, I claim the tube, E, and its reservoir, D, when the former is hinged to a suitable base, A, and is arranged to inclose a supplementary lamp, B.

Third, I claim the arrangement of the tube, E, tube, F, reservoir D, and cap, H.

37,086.—Robert Cornelius, of Philadelphia, Pa., for an Improvement in Lamps:

I claim, first, The hook, s t, for securing the shade to the deflector, and the deflector to the lamp, substantially as above described, or for the purpose of a handle merely to the deflector.

Second, The auxiliary verticle end guide pieces, f f, for directing the air at the ends of the flame and preventing it from expanding or burning irregularly.

37,101.—Mark Levy, of New York City, for an Improvement in the Manufacture of Illuminating Gas:

I claim the arrangement of mixing the gases, generated in separate retorts, from wood and from oil, or its equivalent, and then re-heating the thus-mixed gases before the same are allowed to pass into the purifyer and gasometer, in the manner and for the purpose substantially as described.

RE-ISSUES.

1,358.—Joseph Renard, of Lyons, France, for an Improvement in Treating Aniline to produce a Red Coloring Matter or Dye. Patented April 8, 1859:

I claim the treatment of aniline, in combination with a metallic salt, or the equivalent thereof, with heat, substantially as described, to produce a red, in contradistinction to a purple or bluish coloring matter or dye as set forth.

1,359.—Joseph Renard, of Lyons, France, for an Improved Red Dye from Aniline. Patented April 8, 1859:

I claim the new substance or red dying matter produced by subjecting aniline and a metallic salt, or the equivalent thereof, to a high temperature, substantially as described.

PRIZES

Captured while the U. S. Steamer JAMES ADGER *was on the Blockade off Charleston, S. C, a division from the South Atlantic Blockading Squadron, Flag-Officer Du Pont.*

VESSELS.	CAPTURED.	BY.	FROM.	CARGO.	FLAG-OFFICER.	FLAG-SHIP.	REMARKS.
Ship Emily St. Pierre	Mar. 18,' 62.	James Adger	Calcutta	Gunny cloth	J. R. Goldsborough	Florida	Recaptured, and taken into Liverpool, Eng.
Schooner Guide	April 20, '62.	Gunboat Huron	Charleston, S. C.	100 bales cotton	Capt. J. L. Lardner.	Frigate Susquehanna.	
Schooner Active	April 27, '62.	Gunboat Flambeau	Nassau, N. P.	Assorted cargo	J. B. Marchand	James Adger	
English screw str. Stettin, iron	May 24, '62.	Steamer Bienville	" "	Arms and ammunition.	"	"	
English screw str. Cumbria, "	May 26, '62.	Gunboat Huron	" "	Arms and ass't cargo.	"	"	Augusta claims one-half.
Schooner Julia Wharton	May 28, '62.	Bark Restless			"	"	Captured off Bull's Bay.
Schooner Lydia & Mary	May 28, '62.	" "			"	"	"
English screw steamer Patross	May 27, '62	Steamer Bienville	Havanna	General cargo	"	"	Prize-Master G. D. Upham, U.S. Str. J. A.
Screw steamer Elizabeth	May 29, '62.	Steamer Keystone State.	Nassau, N. P.	" "	E. G. Parrott	Augusta	J. Adger claims half prize-money.
Schooner Cora	May 31, '62.	" "	" "	Salt	J. B. Marchand	James Adger	
Schooner Lacroilla	May 29, '62.	Steamer Bienville	" "	General cargo	"	"	
Schooner Providence	May 29, '62.	" "	" "	" "	"	"	
Schooner Rebecca	May 29, '62.	" "	" "	" "	"	"	
Schooner Catalin	June 20, '62.	Steamer Alabama	Charleston, S. C.	83 bales cotton	"	"	
Schooner Sara	June 20, '62.	Steamer Keystone State.	" "	133 "	"	"	
Side-wheel boat Emilie	July 8, '62.	Screw steamer Flag	Nassau, N. P.	General cargo	"	"	
Schooner Aquilla	Aug. 4, '62.	Gunboat Huron	Charleston, S. C.	Turpentine	"	"	

PATENT AGENCIES.

SCIENTIFIC AMERICAN OFFICE,
NEW YORK CITY—37 PARK ROW,
WASHINGTON, D. C.—F AND 7TH STS.

MESSRS. MUNN & CO., publishers of the SCIENTIFIC AMERICAN and Patent Solicitors for the last seventeen years, would announce to the public that they never possessed better facilities for obtaining Letters Patent and transacting all kinds of business before the Patent Office than they now have.

During the *seventeen years* they have been engaged in procuring patents they have acted as Attorneys for more than SEVENTEEN THOUSAND patentees. Nearly one-third of all the applications for patents annually made in this country are conducted through the "Scientific American Patent Agency," and nearly all the patents secured abroad by American citizens are taken through this Office.

In making an application for a patent, all the inventor is required to do is to furnish a model with an explanation of the operation and advantages claimed. The drawings, petition, specification and other papers are prepared and presented at the Patent Office by MUNN & Co., who have a large corps of engineers, draughtsmen, specification writers and copyists in constant employment. Papers prepared at short notice.

Pamphlets of instruction, announcing the amount of fees, size of model, and other information as to the best made of obtaining patents in this and all foreign countries, are furnished free on application.

For further particulars address
MUNN & CO.,
PUBLISHERS OF THE "SCIENTIFIC AMERICAN,"
No. 37 Park Row, New York.

MESSRS. J. WRIGHT & CO., CONSULTING ENGINEERS and SOLICITORS of PATENTS, No. 42 Bridge street, Blackfriars, London, E. C. Patents for inventions obtained in all countries where Patent Laws are in force.

ESTABLISHED 17 YEARS.

OFFICE FOR THE PROCURATION of Letters Patent and the Registration of Designs. JOSEPH WILLCOCK & CO., Patent Agents and Engineers, successors to Messrs. BARLOW & Co., 89 Chancery Lane, London, W. C.

Gratis and post free, "The Inventor's Manual," also a pamphlet, "L'Obtention de Patentes Anglaises," 500 Mechanical Movements; the first part of Kinematics, or the Transformation of Motion, by Joseph Willcock, C. E., Mem. Soc. of Eng. May be had at the above address, and of any bookseller. Price 2s. 6d.

The second part is approaching completion and will shortly be announced.

ELECTIONS.

THE ANNUAL ELECTION FOR Fifteen Directors of the Manhattan Gas-Light Company will be held on Monday the 12th inst., from 9 to 10 o'clock A. M., at their office, corner of Irving Place and East 15th st.
S. H. HOWARD, Secretary.

OFFICE OF THE NEW YORK GAS-LIGHT COMPANY, 157 and 159 Hester street, cor. of Elizabeth st., New York, December 26, 1862.—The annual election for thirteen Directors of this Company will be held on Monday, 12th inst., from 11 to 12 o'clock A. M., at the office of the Company.

The Transfer Book will be closed until after the election. THOMAS K. LEES, Secretary.

OFFICE OF THE METROPOLITAN Gas-Light Company of the City of New York, New York, December 26th, 1862.—The annual election for twelve Directors of this Company will be held on Monday, 12th inst., at the office, 15 Nassau st.

The polls will be open from 12 to 1 o'clock.

The Transfer Books will be closed from the 29th ult. until after the election. By order,
O. ZOLLIKOFFER, Secretary.

JERSEY CITY WATER LOAN Bonds.—Notice is hereby given that the Interest Coupons, due January 1, 1863, of the Jersey City Water Loan Bonds, will be paid upon presentation at the Ocean Bank, New York city, and the Bank of Jersey City, Jersey City, N. J.
G. S. BOICE, Registrar.
OFFICE OF THE WATER COMMISSIONERS, Jersey City, Dec. 20, 1862.

GAS & WATER-METERS.

R. H. GRATZ & CO.,
PHILADELPHIA METER WORKS,
N. W. corner 23d and Filbert Sts.,
First block above City Gas-Works,
PHILADELPHIA,
Manufacturers of
STATION METERS,
WET & DRY CONSUMERS' METERS,
EXPERIMENTAL METERS,
GLAZED METERS,
PRESSURE REGISTERS,
PRESSURE INDICATORS,
PRESSURE GAUGES,
METER PROVERS,
CENTRE-SEAL DRUMS,
GOVERNOR DRUMS,
PHOTOMETERS,
MINUTE CLOCKS,
WATCHMEN'S CLOCKS, &c., &c., &c.
R. H. GRATZ. WM. C. STILES, Jr.

JOSEPH LENNIG,
1615, 1617, and 1619 Francis St.,
Above Ridge Avenue, Philadelphia, Pa.,
MANUFACTURER OF
WET & DRY GAS METERS,
STATION, SHOW, & EXPERIMENTAL METERS,
Photometers, Pressure Registers, Indicators, and Gauges, Governors Meter Provers, Centre Seals, Fluid Gauges, &c.
GAS APPARATUS
Of the most reliable and approved construction manufactured and on hand at the
UNION GAS METER WORKS.

CODE, HOPPER & CO.,
Continue to Manufacture at the Old Stand
1502 & 1504 Filbert St., Phila.,
GAS METERS (Wet and Dry),
STATION METERS,
PRESSURE REGISTERS,
GOVERNORS,
CENTRE SEAL DRUMS, &c.,
and *all* other articles in their line as heretofore.

H. R. WORTHINGTON'S PATENT Water-Meter.—This Meter combines accuracy, simplicity and remarkable durability, with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.
HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

THE GROVER & BAKER SEWING MACHINE, everywhere triumphant. This Machine has taken the First Premium at the State Fairs last held in

New York,	Missouri,
New Jersey,	Kentucky,
Ohio,	Tennessee,
Indiana,	Virginia,
Illinois,	North Carolina,
Michigan,	Alabama,
Iowa,	California,

Including every State Fair at which it has been exhibited in 1862.

The Work made on the Grover & Baker Machine has taken the First Premium at every Fair in the United States where it has been exhibited to this date.
GROVER & BAKER S. M. CO.,
495 Broadway, N. Y.

POOLE & HUNT, BALTIMORE, MD., are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And all other descriptions of
Iron Work for Gas-Works, Water-Pipes, and Heavy Castings, and Machinery generally.

WOOD GAS.

THE INVENTOR AND PATENTEE of a New and Improved Retort for Manufacturing Gas from Wood, Turf, &c., would call the attention of Gas Companies, and the public generally, to an invention which will be a great saving to the community, as they can thereby supply an exceedingly cheap, clear, and brilliant light, besides useful products in profusion. The Works can be seen in successful operation at the Cremorne Gardens, Fourteenth street and Sixth avenue, on application at the office of the Patentee, No. 23 Liberty street, New York, and where any information may be obtained, and where Companies or private individuals wishing to purchase rights for Hotels, Factories, Private Houses, Cities, Counties, or States, will please apply.

PETROLEUM GAS.

THE AUBIN GAS-WORKS COMPANY, OF ALBANY, N. Y., have adapted their Works to petroleum and the heavy oil obtained from its distillation. Parties desiring information will be referred to Village Gas-Works thus adapted, where the ordinary yield of gas is from 150 to 200 cubic feet per gallon of oil. This yield, and the great improvements which experience has added to the Aubin Works, enable them to make a rich gas at a low cost—the only way to compete with kerosene.

THOMSON'S PATENT
PETROLEUM GAS.
The undersigned is now prepared to sell City, County, and State Rights, for the use of his Patent for the
MANUFACTURE OF ILLUMINATING GAS FROM PETROLEUM.
THE ST. NICHOLAS HOTEL, NEW YORK, IS NOW LIGHTED EXCLUSIVELY WITH THIS GAS.
Apply to JAMES F. HIND, Agent, 40 Barclay st., New York, or JAMES E. THOMSON, Buffalo N. Y.

WATER-GAS WORKS.

WATER-GAS.—W. H. GWYNNE'S PATENT.—W. H. Gwynne & Co. are prepared to make arrangements with Gas-Companies for the adoption of their method of making water-gas, which offers important advantages over any other process; also, to erect new Works of any size. The common coal benches are altered with slight delay and expense, and without deranging the setting. By the use of our apparatus, the following results are obtained:

A gain of *more than fifty per cent.* in the quantity of gas produced from any description of coal.

Facility in making any *quality*, from the most highly carbonized, to the poorest that is susceptible of being distributed.

Ability to use any kind of Coal, from the richest cannel to the poorest semi-bituminous, Petroleum, Tar, or any Hydrocarbon.

Freedom from deposit of any carbon, in either clay or iron retorts.

The White Plains Works, situated on the Harlem Railroad, twenty-five miles from New York, are open to the inspection of all persons interested, and every facility is afforded for the most critical examination of the process and its results.

Address W. H. GWYNNE & CO.,
White Plains, Westchester Co.,
or 41 Pine Street, New York.

SITUATION WANTED.

THE SUBSCRIBER DESIRES A situation as Superintendent of a Gas-Works. Is familiar with all the duties of the position, and can furnish the highest testimonials as to character and competency.—Address
JOHN BENSON,
Care of the AMERICAN GAS-LIGHT JOURNAL,
39 Nassau St., New York.

JOHN McMURRAY, No. 57 Fulton Street, New York, Manufacturer of Copper, Brass, and Iron Wire Cloth for Gas-Works; all kinds of Foundry Riddles, Sieves, and Screens. Improved Wire Window Shades, Wire Bolting Cloth, Duster Wire, Wire Cloth for Fanning Machines, Rosin, &c.; Locomotive Wire, Fire Guards, Ornamental Wire Work of every description. Patent improved Wove and Laid made Dandy Rolls repaired and designed to order.

ANALYTICAL CHEMIST.

C. ELTON BUCK,
Analytical and Consulting CHEMIST,
39 NASSAU STREET, NEW YORK,
Analyses of Ores, Minerals, Soils, Guanos, Coals, &c., and Tests of Commercial Articles, carefully and promptly made. Consultations may be had, and opinions given on Chemical questions. Samples for analysis from a distance, may be sent by mail or express, directed to the Laboratory as above.

LLOYD'S MAPS.

600,000 MALE OR FEMALE AGENTS WANTED TO SELL
Lloyd's New Steel Plate County Colored Map of the United States, Canadas, and New Brunswick,

From recent surveys, completed Aug. 10, 1862; cost $20,000 to engrave it and one year's time.

Superior to any $10 map ever made by Colton or Mitchell, and sells at the low price of fifty cents; 370,000 names are engraved on this map.

It is not only a County-Map, but it is also a
COUNTY AND RAILROAD MAP
of the United States and Canadas combined in one, giving
EVERY RAILROAD STATION
and distances between.

Guarantee any woman or man $3 to $5 per day, and will take back all maps that cannot be sold, and refund the money.

Send for $1 worth to try.

Printed instructions how to canvass well, furnished all our agents.

Wanted—Wholesale agents for our Maps in every State, California, Canada, England, France, and Cuba. A fortune may be made with a few hundred dollars capital. *No Competition.*
J. T. LLOYD, No. 164 Broadway, New York.

The War Department uses our Map of Virginia Maryland, and Pennsylvania, cost $100,000, on which is marked Antietam Creek, Sharpsburg, Maryland Hights, Williamsport Ferry, Rhorersville, Noland's Ford, and all others on the Potomac, and every other place in Maryland, Virginia, and Pennsylvania, or money refunded.
LLOYD'S
TOPOGRAPHICAL MAP OF KENTUCKY,
OHIO, INDIANA, and ILLINOIS,
is the only authority for Gen. Buell and the War Department. Money refunded to any one finding an error in it. Price 50 cents.

From the *Tribune*, Aug. 2.

"LLOYD'S MAP OF VIRGINIA, MARYLAND, AND PENNSLYVANIA.—This Map is very large; its cost is but 25 cents, and *it is the best which can be purchased.*"

LLOYD'S GREAT MAP OF THE MISSISSIPPI RIVER.—From Actual Surveys by Capts. Bart and Wm. Bowen, Mississippi River Pilots, of St. Louis, Mo., shows every man's plantation and owner's name from St. Louis to the Gulf of Mexico—1,350 miles—every sand-bar, Island, town, landing, and all places 20 miles back from the river—colored in Counties and States. Price $1 in sheets. $2 pocket form, and $2 50 on linen, with rollers. Ready Sept. 20.

NAVY DEPARTMENT,
Washington, Sept. 17, 1862.

J. T. LLOYD—Sir: Send me your Map of the Mississippi River, with price per hundred copies. Rear-Admiral Charles H. Davis, commanding the Mississippi squadron, is authorized to purchase as many as are required for use of that squadron.
GIDEON WELLES, Secretary of the Navy.

METROPOLITAN
Boot and Shoe Emporium.
EDWIN A. BROOKS,
IMPORTER AND MANUFACTURER OF
BOOTS, SHOES AND GAITERS,
No. 150 FULTON STREET, AND
575 BROADWAY,
NEW YORK.

NEW BOOKS.

BOOKS FOR GAS ENGINEERS.

A TREATISE ON GAS-WORKS AND THE PRACTICE OF MANUFACTURING AND DISTRIBUTING COAL-GAS. By Samuel Hughes, Civil Engineer.

GAS LEGISLATION, being a copious INDEX TO THE METROPOLIS GAS ACT OF 1860. By Samuel Hughes, C. E.

REPORT OF THE PROCEEDINGS OF BOTH HOUSES OF PARLIAMENT ON THE METROPOLITAN GAS BILL.

A DISCOURSE ON COAL-GAS. By the Rev. W. R. Bowditch, B. A.

THE CHEMISTRY OF GAS-LIGHTING. By Lewis Thompson, Consulting Chemist.

A few copies of the above books, invaluable to gas engineers, are for sale at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, No. 29 Nassau st., New York City.

"NEW BOOKS." ANY OF OUR Readers who may require books on the subject of Gas-Light, Heat, Water, Sewerage, or other scientific matters, can be promptly supplied by addressing the Publisher of The AMERICAN GAS-LIGHT JOURNAL, No. 58 Liberty st., New York.

PORTABLE GAS-WORKS.

STRATTON & BROTHER'S PATENT GAS-WORKS, for making Gas from ROSIN or COAL OILS. STRATTON'S Patent Double Retort, for Coal, Wood, or Rosin.

Our Patent Gas Works have been put up in some forty Country Residences, Factories, Churches, &c., in which an experience of *ten years* gives entire satisfaction.

Water Works also put up in country residences. All work warranted.

Reference—Prof. JAS. C. BOOTH, U.S. Mint, Phila.
CHRISTOPHER FALLON, "
STRATTON & BROTHER,
719 Walnut street, Philadelphia.

THE AMERICAN
PETROLEUM COMPANY,
OF THE CITY OF NEW YORK,
No. 10 Pine Street.
W. W. CLARKE,
Vice-President.

C. R. WOODWORTH, Manufacturer of
PORTABLE GAS WORKS,
74 WALL STREET NEW YORK CITY.

STEAM-PUMPS.

WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies. For Sale at greatly Reduced Prices.

Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

Patent GATES, for Water and Steam-stops.
HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

GAS-METER FLUID.

FLUID FOR GAS-METERS.—The undersigned is prepared to furnish the Glycerine Meter Fluid in quantities to suit purchasers. *It does not evaporate, can be made to stand any degree of cold liable to occur in this country or in Canada, and does not corrode the metals of the meter. It has been in use successfully for the last three years.*

For particulars, references, &c., address the manufacturer, HENRY BOWER,
Box 863, Philadelphia, Pa.

GAS THERMOMETERS FOR ascertaining and regulating the temperature of the gas while passing through the purifiers into the station meters. For sale at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

WOODEN PURIFYING TRAYS.

PATENT CONICALLY SLOTTED SOLID WOOD TRAYS FOR GAS Purifiers. Patented by Wm. Coube.

CAUTION TO GAS MANUFACTURERS.

Letters Patent having been issued to Mr. N. O. Hawxhurst, assignee of Wm. Coube, all persons are cautioned against purchasing said trays of any party except the subscriber, who is the only authorized agent for their manufacture and sale.

JOHN L. CHEESMAN,
147 Ave. C, New York City.

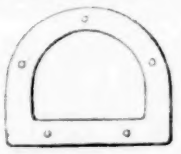
CONICALLY SLOTTED SOLID Wood Trays for Gas-Purifiers.—Admitted to be the best, cheapest, and most durable seives for gas-purifiers ever used.

Secured by Letters Patent of the United States, both for the machinery used in the manufacture, and for the seive itself.

For sale on reasonable terms to Gas-Light Companies or Agents, on application, by letter, to the patentee, RICHARD G. HUNT,
631 Fourth st., near Avenue C,
New York City.

N. B.—All persons are warned against purchasing these seives of others who falsely pretend to have patents for them. Suits will be commenced immediately against all persons infringing my patents by using or making wooden sieves, but those who hereafter purchase from me can buy their seives cheap and will not be troubled by me on account of former purchases. R. G. H.

COWEN'S PATENT FIRE-CLAY RETORTS.



JOSEPH COWEN & CO.,

BLAYDON BURN, near Newcastle-on-Tyne, England,

Have always been, and are still, the most extensive manufacturers of FIRE-CLAY RETORTS in the United Kingdom, and were the only parties to whom a Prize Medal was awarded at the Great Exhibition, in London, 1851, for

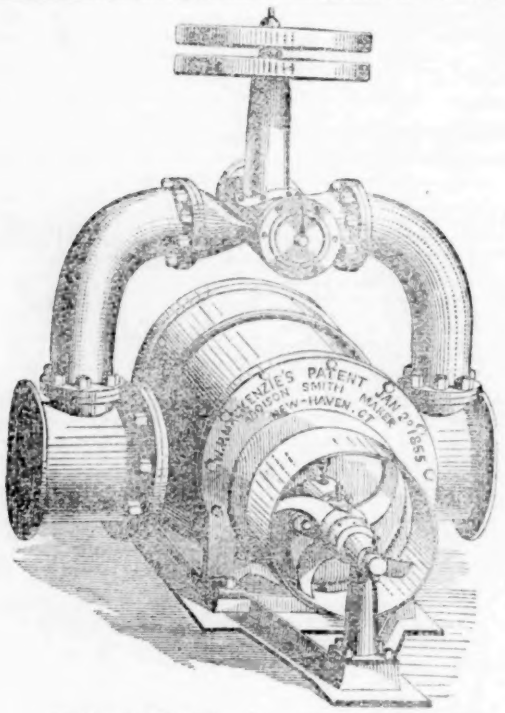
"GAS RETORTS, AND OTHER OBJECTS IN FIRE-CLAY."

J. C. & CO. make Fire-Clay Retorts of all shapes and dimensions, and to fit existing mouth-pieces.

Orders for FIRE-CLAY RETORTS, TILES, BEARERS, and other articles in Fire-Clay, receive immediate attention, and are promptly executed at their Works, as above. Drawings of Settings adapted for Cowen's Patent Fire-Clay Retorts supplied.

AGENTS, MESSRS. MEAD & BELL,
13 CLIFF STREET, NEW YORK.

N. B.—J. C & CO.'S RETORTS are well adapted for small Gas-Works, as they can be used without an Exhauster.



SMITH & SAYRE,

Sole Proprietors and Manufacturers of

THE MACKENZIE PATENT GAS EXHAUSTER

AND

PATENT COMPENSATOR.

They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. fuel. Address SMITH & SAYRE, 456 Broadway, New York.

PRINCE'S METALLIC PAINT,

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. It prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though sold at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, rouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Four Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

DANIEL SLOAN, General Agent,
71 MAIDEN LANE, NEW YORK.

Local Agents—S. R. WILLIAMS, 204 South Front st., Philadelphia.
CALVIN GAY, 81 State st., Boston.

GAS-ENGINEERS.

JOHN JEFFREY, GAS ENGINEER, Cincinnati, Ohio, is prepared to furnish Plans, Specifications, Estimates, and Proposals for Gas-Works of all sizes, suitable for lighting Cities, Villages, or Private Dwellings, Hotels, &c. &c. Also, to act as Consulting and Visiting Engineer for Gas-Works already established, in any part of the country.

He refers to most of the principal Gas-Works in the West, and upwards of twenty years extensive experience in Gas-Works.

A CIVIL ENGINEER, HAVING A number of years experience in the manufacturing of COAL-GAS, is desirous of obtaining charge of some department in a first-class Gas-Works, or charge of the same in the country. Salary not the principal object. Best of reference. All communications will receive a prompt attention. Address
R. M. B.,
Post O., Philadelphia.

NEWSPAPER WRAPPERS. Mara's Patent Self-Sealing and Folding Water-lined Newspaper Wrappers, $1.50 per 1000. Sold by
F. W. BOND,
Sole Agent for the Patentee,
58 Liberty st., New York.

GAS AND WATER-PIPE.

W. & J. GRIFFITHS & CO.—City Tube Works, Malleable Iron and Brass Foundry, No. 27 North Seventh street, Philadelphia. Manufacturers of Wrought Iron Pipe, Lap-Welded Flues and Fittings; also, Brass Work of all descriptions, for Gas, Steam and Water. Particular attention given to Heating Buildings, &c.

PATENT BITUMENIZED PIPES for Water, Gas, and Drainage.—These pipes possess all the properties necessary for the conveyance of Gas, Water, and also for Drainage purposes, viz., great strength, great durability, and perfect inoxidability; and being non-conductors are not affected by frost, like metal pipes; they are proved to resist a pressure of 220 lbs. on the square inch (equal to 500-ft. head of water), and can be made up to any greater strength if required. They are only one-fourth the weight, and when laid down are fifty per cent. cheaper than iron pipes; they are made in 7 ft. lengths, and the joinings are simple and inexpensive.

These Pipes have been in use nearly three years, and have given the most perfect satisfaction.

Further particulars as to joining, &c., and specimen pipes, may be obtained by addressing
FREDERICK W. BOND,
58 Liberty street, New York.

THE TWO GREAT PATENTS OF THE DAY.

1.—Improved Mode of Setting Gas-Meters in the Walls of Buildings

2.—Cast-Iron Mail-Stations for Public Lamp-Posts.

Adopted by the UNITED STATES GOVERNMENT for the Principal Cities.

ALBERT POTTS, Philadelphia, Patentee.

By the FIRST IMPROVEMENT the Meters may be inspected at any time from without, by the agents of the Gas-Company having keys for that purpose. Thus burglars need no longer gain admittance to dwellings under pretense of examining the meters, while they, in fact, examine the fastenings. The meter-box, being neatly and securely imbedded in the front wall, the meter is protected against frost by means of a thick pad on the back of the door. It has been satisfactorily tested in long continued severe weather and found to be eminently successful.

The SECOND IMPROVEMENT speaks for itself. The cities of New York and Philadelphia are already supplied with these boxes, and the convenience to the citizens and increase of revenue to the Post Office Department are most marked. Always in sight, securely fastened to the most public objects, protected by light, day and night, they have become the most popular of all modern improvements and will be immediately adopted throughout the country.

Both of these improvements are to be seen at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, New-York City. For further information address the Proprietor of this JOURNAL, who is authorised to contract for the use of both Improvements, or

ALBERT POTTS, Philadelphia.

ARMY AND NAVY PAY AND CLAIM OFFICE.

ARREARS OF PAY, BOUNTY, AND PENSIONS

Secured to Heirs of Deceased Army and Navy Officers and Men. Accounts of Resigned and Deceased Army and Navy Officers adjusted and cashed.

APPROVED CLAIMS

AGAINST ALL THE DEPARTMENTS, PURCHASED OR COLLECTED.

EXTRA PAY

SECURED FOR DISCHARGED ENGINEERS, SOLDIERS, AND MILITARY LABORERS.

PRIZE MONEY.

EXTRA PAY

SECURED FOR COMPANY OFFICERS OF ALL

CAVALRY REGIMENTS.

The business of this office is transacted in Washington by SPECIAL AND EXCLUSIVE AGENTS, resident there, and familiar with the routine of all the Departments.

JOHN B. MURRAY,

ARMY AND NAVY BANKER,

No. 39 Nassau Street, New York, opposite the Post-office.

PATENT BITUMINIZED PIPES,

For the Conveyance of Water, Gas, and Drainage.

This important inventio n, patented by Mr. Charles Newbold, and now for the first time introduced to the public, may confidently be stated to be one of the greatest interest and commer cial value, as the Patent Bituminized Pipes possess all the qualities necessary for the conveyance of Water, Gas, Sewage, Mine-Pumps, &c., viz.: great strength, great durability, and inoxidability, with the immense advantage of being about *one fifth* the weight of iron pipes, and about 35 per cent. cheaper; whilst, compared with lead pipes, the Bituminized Pipes are only about *one fourth* their price, without the possibility of the formation of the oxide and carbonate of lead, so dangerous for every purpose. They will stand 150 degrees of Heat, and after many trials it has been satisfactorily proved that rats or vermin will not touch them. They also withstand the action of all acids and salts.

Iron pipes are at present frequently covered with a coating of bitumen or coal tar before they are laid down; but the adherence of this coating to the metal being very imperfect, on account of vibration and the difference of expansion, this preservation is insufficient, besides being exposed to a number of influences which neutralize its efficacy—galvanic currents materially assist the formation of oxides and deposits, which cause the obstruction and eventually the destruction of metallic pipes.

The Patent Bituminized Pipes are neutral, non-conductors of electricity, and consequently are not exposed to any of the deteriorating influences mentioned above. The process of manufacture of these Pipes consist in causing a roll of paper to pass through a reservoir of melted bitumen, after which it is tightly coiled around a mandril to any required thickness; and thus, when hardened, a tube is formed of perfect texture, great hardness, and enormous strength. These Pipes are proved, by hydraulic pressure, to resist a pressure of 220 lbs. to the square inch, equal to 506 feet head of water, which is more than double the altitude of the highest reservoir. The bituminous composition which unites and covers these Pipes is so well known as an excellent preservative, that it will be unnecessary to demonstrate that, when laid underground, the durability of the Patent Bituminized Pipes may be considered as unlimited. The Pipes are made in lengths of seven feet, and are connected by socket joints of the same material as the Pipes; or they can be fitted with iron flanged sockets, screwed together in a most simple and inexpensive manner.

For Gas these Pipes are invaluable; the Gas-lining which we insert effectualy resists the action of Gas, and being non-conductors, there can be no condensation in them, and the joints made with the Patent Cement are so strong as to entirely prevent Leakage.

The cost of laying the Pipe is also small, compared with those of iron, and can be done by mere laborers. The Bituminized Pipes have been in use the last three years, for the conveyance of gas and have been ascertained to be as perfect now as when first laid down.

DIRECTIONS FOR JOINING THE PATENT BITUMINIZED PIPES.

Pack the pipes level in the ordinary way; slip the collar over one of the pipes; draw the ends close together and warm them by putting a hot iron between them; then press them together so as to make them adhere; take a piece of iron wire netting, about half an inch in the mesh, a little narrower than the length of the collar, and long enough to wrap once round the pipe, spread the collar over it and the joining; close the ends with clay; pour the melted cement into the manhole of the collar, and fill up the interior space; then remove the clay and the joint is finished.

It is necessary to leave a small vent hole in the clay at each end of the collar to allow the air to escape as the cement is poured in, that there may be no flaws or air bubles in it when cold. If in cooling the cement settles in the manhole, fill up again.

N. B.—The cement should be broken into small pieces and melted in a pot as you do lead, at a low temperature, until it is dissolved; it must be stirred while melting; then take it off and keep stiring it as it cools until it becomes nearly as liquid as water; then pour quickly.

All Orders should be addressed to

THE AMERICAN BITUMINIZED PIPE COMPANY,

OFFICE 24 WATER STREET, BOSTON, MASS.,

J. McGEARY, AGENT;

or to FREDERICK W. BOND,

SOLE AGENT FOR NEW YORK,

58 LIBERTY STREET, (Between Broadway and Nassau Streets,) **NEW YORK.**

Cement for Joining, For Sale as above.

POTTS' REVOLVING SIGNAL LIGHTS,

PATENTED SEPTEMBER 8, 1857.

Mr. ALBERT POTTS, the well known Inventor of the LAMP-POST LETTER-BOXES, which have been adopted by the Post-Office Department for the large cities of the United States—and also of the GAS METER BOX, to be set in the front walls of houses, thus doing away with visits from Gas Inspectors, or burglars in gas-clothing, has lately brought forward a third Invention, which, in point of importance and world-wide usefulness, surpasses the others entirely.

These SIGNAL LIGHTS are intended for use on Vessels propelled by Steam, and those exclusively. They specially indicate the presence of a Steamer, and by their use there will be less likelihood of mistakes, and consequent collision, than at present. They are also intended for SIGNALLING AT NIGHT, and can be used for that purpose UNDER ANY CODE of SIGNALS NOW ARRANGED FOR FLAGS.

This Improvement in Lights for Steam Vessels consists in having the Lanterns containing the colored lights connected by means of a series of cogged gearing with some convenient part of the Engine or Machinery, so as to cause them to have a revolving motion around their axis. On side-wheel steamers, the Lanterns should be placed directly over the wheel-houses, and the power, or motion to turn them, may then be very conveniently obtained from the paddle-wheel shaft. On Propellers, the Lanterns should be placed on each side of the Pilot House, or hurricane deck, and the rotary motion derived from any convenient or suitable part of the Engine or Propeller shaft. Each Lantern is supported on the end of movable cranes, so that their relative positions may be changed and properly adjusted to suit the view of observers on either side of the vessel at the time of signalling.

The Lanterns to be used in this improvement may be constructed for Burning Oils, Fluids, Gas, or any of the known modes of illumination, and should be furnished with one or more lenses and reflectors, so as to concentrate the rays of light, and project them over the horizon with the greatest intensity. The lenses for this purpose should be made with colored glass, viz., Red and Green, and the position of the respective Lanterns, according to the color of the lenses therein, must be placed on the sides of the vessel so as to answer to the requirements of Rules and Regulations made and published by the Supervising Inspectors of Steamboats, agreeably to the Act of Congress of the United States in such cases made and provided. That is to say—by said Regulation—the Lantern having the green lenses for producing the Green Colored Light, must be placed on the starboard side of the vessel, and the other Lantern producing the Red Light, to be placed on the port side thereof. In pursuance, also, of the aforesaid Rules and Regulations, there is to be found in board and behind each Lantern, a screen to answer the purposes therein mentioned.

The cogged gearing, by which the Lanterns are connected with the Engine or paddle-wheel shaft, and thereby caused to revolve when the Engine is in motion, is so arranged that the connection may be readily shipped or unshipped, and the Lanterns made stationary or otherwise, at the pleasure of the Pilot, or those whose duty it may be to operate and attend to the same. The cranes on which the Lanterns are placed are also rigged so as to be readily turned horizontally from one position to another, so as to present one or both lights to the view of observers when laying athwart ships at the time of signalling.

On the Use and Application of the Improvement for Night Signals.

When the vessel is under weigh or going ahead in its course, the Lanterns are to be placed directly athwart ships, so that such colored light therein will then have the position and place prescribed by Rule Seventh of the afore-said Supervising Inspectors of Steam Boats, and with the screens behind them, as above described, will then answer all the intents and purposes for which the colored lights are thus required to be used, as illustrated in the several diagrams published by said Inspectors for the working of a system of Colored Lights. The Lights in this case, according to the color seen by the observer, indicate the course or direction of the vessel whereon they are carried. When the Lanterns with the colored lights therein, are made to revolve around on their axis, as proposed in this improvement, in addition to the signal above, another, and as we believe, very important and useful signal is thus formed, indicating that the vessel, whereon it is carried is a Steamer. In dark foggy nights, it is found by experience, to be somewhat of a difficult task to distinguish sailing vessels from Steamers and Propellers, especially when the latter are rigged, and carry a press of sail. When Steamers meet "head and head," it is the duty of each to pass to the right, or, on the larboard side of the other. Whereas, when a Steamer meets a sailing vessel, the former must give way and allow the latter to pursue its course. Hence, to carry out the regulations of the said Steamboat Inspectors, and prevent collisions, it is important to have some infallible sign, whereby the character of the vessel may be readily seen and determined. Several very fatal collisions have recently taken place through mistakes of this kind.

On Signals for Speed and Distance.

The gearing of the Lanterns with the paddle wheel or propeller shaft, may be so arranged as to be an index of their speed. A very good proportion, would probably be to make the Lantern turn about one third as fast as said shaft. Hence, when the speed of the vessel is previously known, when making a certain number of revolutions of the paddle or propeller, it becomes an easy task from observing the time with which the Lanterns thereon may be turning to approximate to the speed with which the said vessel is moving at the time of observation. Again, as the arcs described by the rays of light from each lantern, as they revolve around on their axis, is greater in proportion to the distance from said lantern, so will the time in which said rays move over any given space, be less in the same proportion. Hence, when the lights are very remote, or far off, from the observer, the duration of each column or cylinder, of rays from each lense, would pass the eye of the observer, in a short space of time, or with great velocity. Whereas, at a nearer point of observation, the time of its passage would be considerably lengthened, or the motion thereof apparently much slower. From these facts, we believe the improvement is susceptible of indicating, in an approximate manner, the speed and distance of vessels whereon the revolving lights may be used.

On the Application of the Improvement for Marine Telegraphic Purposes.

The Revolving Lights can be readily applied to the general purposes of Marine Signalling at night, as follows: In order to show this application, we have adopted the Numbers as given in Roger's Code of Marine Day Signals, believing that work to be somewhat of a standard in matters of this kind. Instead of the flags used in the above code, for day signals, to indicate the combinations of two or more letters of the Alphabet, which combination is referable to certain numbers indicative of the words or sentences telegraphed, we propose to perform the same operation, at night, by means of the two revolving colored lights, so as to indicate the numbers directly to which the intended words or sentences to be telegraphed are referable. Thus, whether the vessel to be signalled is ahead, astern, or abaft the beam, the position of the two colored lights must be so adjusted, by means of the moveable cranes, whereon said lanterns or lights are fixed, that the two lights may be fully made visible to the observer. When both lights are thrown into this position, stopping the motion of the lanterns may be the signal for calling attention, or a rocket fired off, or the steam whistle blown, would answer the same purpose. Now, in order to represent the ten numerals, we propose to indicate them by the respective motions of the two colored lights, as follows:

RED LIGHT.	GREEN LIGHT.
One Red, Represents Number 1.	Two Green, Represents Number 2
Three do. do. do. 3.	Four do. do. do. 4.
Five do. do. do. 5.	Six do. do do. 6.
Seven do. do. do. 7.	Eight do. do. do. 8.
Nine do. do. do. 9.	One do. do. do. 0.

In the above arrangement, it will be seen that all the odd numbers are made by the Red Light, and the even numbers by the Green Light. In order to indicate the repeat of the last number, once or more times, or for other special purposes, which may hereafter be found useful and necessary, an even number of lights may be shown by the Red, and an odd number by the Green. It will be understood that when the Lanterns are made with three lenses in them, the numerals as above arranged are formed by the number of times a new light or lense is presented to the observer. Thus to indicate the number 3, the Red Light or Lantern would make one entire revolution; and to make the number 6, the Lantern carrying the Green Light would make two revolutions, and so on with the other numbers. When a symbol is made, the motion of the Lantern is to be suspended for a short time, and when a number expressing a sentence is formed, the lantern may be stopped for a longer period, or some one of the special signals above referred to, may be used for this purpose.

To show the application of this improvement as above mentioned, whereby these Lights can be used as readily for Night Signals, as Flags are used for Day Signals by the author of Roger's Code, we shall use the sign O colored red or green, according to the light used, to show the number of movements performed by the respective lights in order to represent any desired number of said code, suitable for the required purpose.

RED LIGHT.	GREEN LIGHT.
O, O, O, O, O,	
O, O, O, O, O, O, O.	
	O, O.
	O. O.

The above would represent the number 5722, and by reference to said Roger's Code, would be found to stand before the sentence:

"WILL YOU SHOW THE NUMBER THAT REPRESENTS YOUR NAME?"

RED LIGHT.	GREEN LIGHT.
O.	
O, O, O, O, O.	
O, O, O, O, O, O, O.	
	O, O.

Here the number expressed is 1572, and per the same Code, stands for

"WHERE ARE YOU BOUND?"

RED LIGHT.	GREEN LIGHT.
O.	
O, O, O, O, O, C, O, O, O.	
	O. O
	O, O. O. O, O, O, O. O

The number thus expressed is 1928, and per said Code is

"WHAT IS YOUR CARGO?"

RED LIGHT.	GREEN LIGHT.
O, O, O, O, O.	
	O, O, O, O, O, O.
	O.
O, O, O.	

Here the number expressed is 5603, and stands for

"HAVE YOU ANY NEWS?"

(RED LIGHT.)

Fig. 2

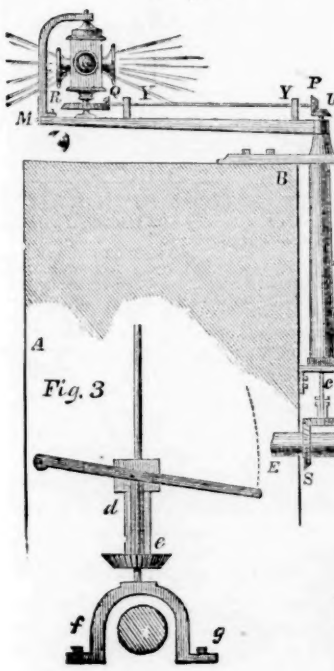


Fig. 3

(GREEN LIGHT)

Fig. 1

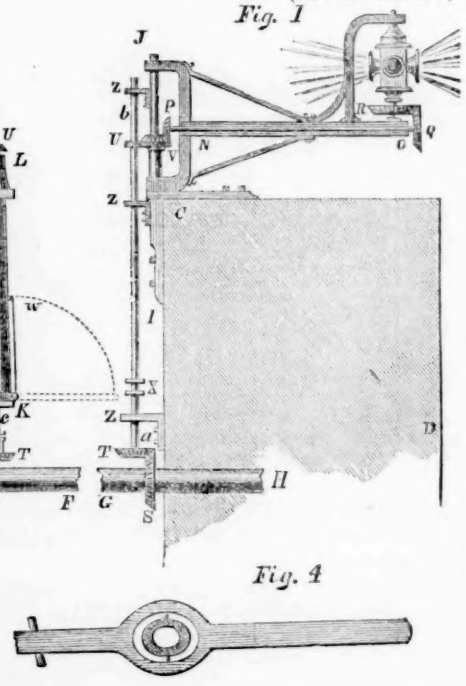


Fig. 4

MECHANICAL CONSTRUCTION.

In our engravings, Figs 1 and 2, represent Vertical Sections through the wheel-house. In them E F and G H represent portions of the main Shaft. In Fig. 1, I J is a stout Iron or Wooden post, fastened against the side of the wheel-house, directly over the main shaft. On the upper part of this post, is fitted the moveable arm or crane N O, to the main shaft is fitted the bevel wheel S, and to the lower end of the rod a b, is fitted a corresponding wheel T. U is a small pinion on a b, which gears with the spur wheel, V, which in turns gives motion to the wheels, P and Q, and so revolves the lamp R. It will be seen that a Rotary motion is given to the lamp, when the main shaft is in motion and a b connected.

It can be disconnected by a lever, acting between the bosses X, which will elevate the rod in the guides Z Z Z.

Fig. 2 is another arrangement, for the same purpose. In this, K L represent a hollow Shaft, on which is firmly fastened, the arm L M, on which is the lantern. The hollow post is secured to the wheel-house by the straps K and B, and it can turn freely in them, the other part being the same in them as in fig. 1

The lever K W, when drawn down, will turn the frame in any required position around the Shaft c U. In fig. 1, the arm or crane N O, may be operated by cords from the wheel house, but in this device, the rod c U, does not lift up as in fig. 1, but in its place, the lower end is made square, and on it slides the short tube, d E, shown in fig. 3. The lower end of the rod turns on a bridge, f g, spanning the main shaft. On the upper end of the tube, d e, a lever is attached by means of boxes and collars as shown in fig. 4. This lever when raised carries with it the beveled wheel T, thus disconnecting the gearing apparatus.

ALBERT POTTS, Patentee,
PHILADELPHIA, Pa.

OUR AGENTS.

AGENTS OF
The American Gas-Light Journal,

From whom it can be purchased in single copies or by the year.

TERMS—$3 per annum. Single copies 15 cents. Liberal discount to Dealers.

ALBANY, N. Y.	Thomas Hastings, P. L. Gilbert, Wm. J. Bell.
BOSTON, Mass.	D. Howard, Jr., Cushing & Bowen.
BRIDGEPORT, Ct.	News Agent at R. R. Station.
BUFFALO, N. Y.	T. G. Hawks, B. F. Felton, D. Lockwood.
CARMANSVILLE, N. Y.	W. Cameron.
CATTSKILL, N. Y.	W. Van Loan.
CHICAGO, Ill.	J. McNally, J. R. Walsh, Shear & Co.
CLEVELAND, O.	Hawks & Bros.
COLDSPRING, N. Y.	A. Tenant.
DOBBS' FERRY, N. Y.	E. Ackerman.
ELIZABETH, N. J.	R. Caldwell, Wm. Gale.
ELMIRA, N. Y.	M. B. Brink.
FALL RIVER, Mass.	L. J. Moroo.
FISHKILL LANDING, N. Y.	J. R. Van Slyke.
FISHKILL VILLAGE, N. Y.	B. Stanbach.
FORT WASHINGTON, N. Y.	J. Maloney.
FRANKLIN, N. Y.	G. W. Reynolds.
GALENA, Ill	G. H. Schenck.
HARTFORD, Ct.	D. C. Pond, C. J. Geer.
HASTINGS, N. Y.	D. Crane.
HUNESDALE, Pa.	A. G. Forbes.
HUDSON, N. Y.	G. Parton.
HYDE PARK, N. Y.	J. N. De Graff.
JAMESTOWN, N. Y.	G. W. Hazletine.
KINGSTON, N. Y.	C. Van Buren.
MILBURN, N. J.	W. Hastings.
MORRISTOWN, N. J.	J. West, J. R. Runyon.
NEWARK, N. J.	Agens & Co., J. R. Jillison.
NEWBURG, N. Y.	W. H. Callahan, J. M. Martin, P. C. Daly, G. P. Lomas.
NEW HAVEN, Ct.	E. Downs, T. H. Pease.
NEWPORT, R. I.	B. J. Tilley.
NEWTOWN, N. J.	H. Warren.
NYACK, N. Y	H. Hazelbarth.
PEEKSKILL, N. Y.	J. A. Green.
PHILADELPHIA, Pa.	V. H. Myers, 152 South Fourth street.
PITTSBURG, Pa.	J. W. Fittock, Henry Miner, L. P. Hunt.
POUGHKEEPSIE, N. Y.	J. H. Bush, W. Patrick, G. Williamson.
PROVIDENCE, R. I.	D. Kimball,
RAHWAY, N. J.	W. H. Neefers.
RONDOUT, N. Y.	A. M. Barbes, Winter Bros.
SARATOGA SPRINGS, N. Y.	A. Hill.
SAUGERTIES, N. Y.	T. J. Barrett.
SING SING, N. Y.	F. Bushers.
SOMMERVILLE, N. J.	C. Barkalow.
STAMFORD, Ct.	G. R. Treate. News Agent at R. R. Station.
ST. JOHNSVILLE, N. Y.	G. A. Russell.
SYRACUSE, N. Y.	J. H. Green.
TARRYTOWN, N. Y.	C. De Riviere.
TOLEDO, O	L. C. Shear.
TROY, N. Y.	L. Willard, J. F. Hoyt.
WASHINGTON, D. C.	Frank Taylor, P. De Vine, Kirkwood House, News Agent Willard's Hotel.
WATERBURY, Ct.	D. J. Bishop.
WELLSVILLE, N. Y.	Wm. Patton.
WEST POINT, N. Y.	H. N. Sheerar, R. A. Grand, opposite West Point.
YONKERS, N. Y.	D. Burns, John Featherstone.

General Agents in New York City.

ROSS & TOUSEY, 121 Nassau Street.

H. DEXTER & Co., 113 Nassau Street.

ORIE, DAYTON & JONES, cor. Ann and Nassau Sts.

L. N. SHEAR & Co., 55 Hudson Street.

HAMILTON, JOHNSON & FARRELLY, 22 Ann Street.

J. F. FEEKS & Co., 24 Ann Street.

F. S. THOMSON, New Haven Railroad Station, 27th Street.

THOMAS FITZGIBBONS, New Jersey and Amboy Railroads.

ALEXANDER CRAW, Harlem Railroad Station, 26th Street.

WM. SKELLY, Greenwich Street, Erie Railroad Station, Duane Street.

In Canada.

THE AMERICAN GAS-LIGHT JOURNAL can be ordered through any of the News Agents in either of the Canadas.

In Great Britain.

Terms 15s. per annum, single copies 10d.

TRUBNER & Co., 60 Paternoster Row, London.

In France.

Terms 15 Frs. per annum.

Bureau of *Le Journal de l'Eclairage au Gaz*, Boulevard de Poissonniere, No. 24, Paris.

ROOMS IN NEW YORK.—No. 39 Nassau Street, opposite the Post Office.

Terms—$3 per annum. Single copies 15 cents.

GAS-FIXTURES.

MITCHELL, VANCE & CO.,
MANUFACTURERS OF
CHANDELIERS,
And every description of
GAS-FIXTURES,
WAREHOUSE, No. 620 BROADWAY.
Manufactory,
Nos. 335, 337, 339, 343 WEST 24TH STREET, New York.

GEORGE H. KITCHEN & CO.,
Manufacturers of
Fixtures for Gas-Light Purposes,
Wood's Building, No. 561 Broadway, New York.
Office of the Inspector of Gas Meters for the State of New York.

HERRING'S PATENT
Champion Fire-Proof Safes.

Herring's Champion Burglar-Proof Safes, with Herring & Floyd's New Patent Crystalized Iron, the only metal which cannot be drilled.

Nearly 25,000 Herring's Safes have been made and sold, and over 500 have passed triumphantly through accidental Fires, thus fully sustaining their acknowledged and well-earned character as the "best Fire-Proof Safes the world ever saw."

Herring's New Patent Burglar-Proof Safes, made of a combination of Wrought Iron, Patent Crystalized Iron, and Bars of Steel, are confidently offered to the public as the strongest and best security against skilful burglars now extant.

It was a "Herring's Burglar-Proof Safe," the public will remember, which so lately held secure its trust against the determined ingenuity of the boldest and greatest mechanical burglars this country has ever known, and saved for the New York Exchange Bank no less than

HALF A MILLION OF DOLLARS.

Herring's Patent Fire and Burglar-Proof Safes *combined*, (one Safe within another,) making the most perfect protection from fire and thieves now known.

FIVE OF HERRING'S SAFES VICTORIOUS!
WELLSBORO', Penn., December 21, 1861.
Messrs. Herring & Co., New York:

Gentlemen,—At the great fire which occurred here on the 18th December last, my store, with a number of other buildings, was entirely destroyed; no less than seven places of business were burnt out and five of your safes severely tested, in every instance saving their entire contents, to the complete and perfect satisfaction of the owners. Two of your Herring's Patent Champion Safes which were in my building remained there through the entire conflagration, and were not opened until the day after the fire. No water was thrown on the building. Everything in my safe after the fire was nearly as good as new. C. L. Wilcox also preserved all his books, papers, and money in two of your safes, both being in same fire. Wm. Roberts was also the fortunate owner of another of your Patent Champion Safes, which was severely tested, and saved completely his books, papers, and money. The result has given great satisfaction, and we want no safe but Herring's Champion. Please send me one same size I last bought of you immediately. Send by N. Y. & Erie R.R. via Tioga depot. JOHN R. BOWEN.

I had two of Herring's Safes in above fire. They saved my books, papers, and $2,000 *in bank bills*. C. L. WILCOX.

HERRING'S PATENT CHAMPION saved my books, papers, and about $400 in *paper money*. I would use no other. WILLIAM ROBERTS.

GREAT FIRE IN PEARL AND FULTON STS.
NEW YORK, Jan. 27, 1862.
Messrs. HERRING & Co., No. 251 Broadway:

Gentlemen,—The large HERRING'S PATENT CHAMPION SAFE you made for me a few years ago has been put to a severe test in the great fire corner Fulton and Pearl sts., on the 26th inst., which entirely destroyed my building, together with many others.

The fire commenced about 6 o'clock on Sunday morning, and the safe was taken from the ruins after an exposure of more than thirty hours.

Your Safe contained all my books, insurance policies, and other valuable papers besides, gold and silver, bank bills, coupon bonds, &c., amounting to over Two Hundred Thousand Dollars. Everything in the Safe is in perfect order, except the binding of the books being steamed.

Your Patent Champion Safe gives us great satisfaction, and has guarded safely through the fire every dollar of its contents.

Truly yours, A. S. FOSTER.

GREAT FIRE IN NEW JERSEY.
NEW BRUNSWICK, N. J., January 18th, 1862.
Messrs. HERRING & Co.,
No. 251 Broadway, New York:

Gentlemen,—At the recent extensive fire in our city, on Wednesday morning last, 15th inst., I was the fortunate owner of one of your HERRING'S PATENT CHAMPION SAFES, which contained some books and a number of valuable papers.

The heat in my store was very great, and the safe subject to an intense heat. I felt great interest in the safety of my papers, as a number of castings in my store and within a few feet of the safe were melted. Nothing, indeed, was saved in my building, except the contents of your safe, which I am happy to inform you was completely preserved, after a thorough roasting for some seventeen hours. The result has exceeded my anticipations, and fully confirmed my confidence in the security of your Herring's Patent Safe. Please send me another of larger size, and refer all incredulous to my books and papers, which it gives me great pleasure to show.

WM. H. ARMSTRONG.

Herring & Co., 251 Broadway.
Farrel, Herring & Co., Phila.
Herring & Co., Chicago.

IRON FOUNDRIES.

WARREN FOUNDRY AND MACHINE CO., Phillipsburg, N. J. Manufacturers of Cast-Iron Pipes, from 2 to 48 inch diameter, all pipes from 3 inch to 48 inch cast vertically, and in dry sand, in lengths of 12 feet. 2 inch pipes in lengths of 7 feet. Special Castings of all descriptions furnished at short notice.

REFERENCES.
Croton Aqueduct dept., N. Y.
Manhattan Gas Lt. Co., N. Y.
Brooklyn Water dept., N. Y.
Brooklyn Gas Lt. Co., N. Y.
Citizens' Gas Lt. Co., Brooklyn, N. Y.

MORRIS, TASKER & CO.,
PASCAL IRON WORKS,
[ESTABLISHED 1821.]
PHILADELPHIA, manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues,
GALVANIZED WROUGHT IRON TUBES,
ARTESIAN WELL PIPES,
of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works,; Cast-Iron Street Mains, Bends, Branches, Drips, &c.
GAS AND STEAM FITTERS' TOOLS, &c.
STEPHEN MORRIS, CHAS. WHEELER.
THOMAS S. TASKER, STEPHEN P. M. TASKER.

BERGEN IRON WORKS,
Established 1833.
R. A. BRICK, Manufacturer of CAST IRON WATER and GAS-PIPES. RETORTS, PIPES, &c., always on hand. Office, 109 Leonard Street, New York.

S. FULTON & CO., (Successors to Colwell & Co.) Manufacturers of Pig Iron and Cast Iron Gas and Water Pipes, also Heavy and Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.
SAMUEL FULTON, THEO. TREWENDT.

FLORENCE IRON WORKS.—The subscriber is prepared to execute orders and make contracts for Cast-Iron Water and Gas-Pipes, from 2 inches to 48 inches in diameter; also, Retorts, Bench-Castings, Branches, Bends, and all Castings for Water or Gas-Works. Pipes and Castings coated with Smith's Patent Coal Tar Varnish to prevent corrosion.
JOSEPH G. JONES,
205½ Walnut Street, Philadelphia.

THE ALPHA TUBE WORKS,
WALSALL, STAFFORDSHIRE.—Established 1830.
LAMBERT BROTHERS,
Manufacturers of
LAP-WELDED BOILER TUBES, LOCOMOTIVE AND MARINE ENGINE FITTINGS,
WROUGHT IRON WELDED PIPE,
FOR STEAM OR HIGH-PRESSURE WATER AND GAS;
HIGH-PRESSURE STEAM AND WATER VALVES,
FIRE & GARDEN ENGINE WORK, PUMPS, HYDRANTS, WATER-CLOSETS,
IRON AND BRASS GAS-FITTINGS,
GASELIERS, &c.,
AND OF THE GROVE BEDSTEAD WORKS, WALSALL.
Delivery Free, in Liverpool, &c.
Catalogues post free.

A small *general* selection of current Manufactures for the Steam-engine, Water Supply, Gas-Works, Distilleries, Brewery, Chemical Works, Mills, &c., at the International Exhibition, Walsall Court, Class 31.

R. D. WOOD & CO.,
MANUFACTURERS OF
CAST-IRON PIPE, RETORTS, &c.
Office, 400 Chestnut Street,
PHILADELPHIA.

GAS-BURNERS.

T. G. ARNOLD,
MANUFACTURER OF
GAS-BURNERS,
And Importer of SCOTCH TIPS,
No. 447 BROOME ST.,
Second door west of Broadway, New York.
Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers, &c., &c.

ORNE'S PATENT FILTER REGULATING GAS-BURNER,
Admitted by all practical and scientific men who have examined its movements, to be
THE BEST GAS-BURNER YET INVENTED.
They are
Self-Regulating,
Gas-Purifying,
Indestructible, and
Most Economical.
For sale by—
S. A. STETSON & Co.,
350 WASHINGTON STREET,
Boston, Mass.

AMERICAN GAS-LIGHT JOURNAL.
A FEW COPIES OF
Vols. I. and II.
SUBSTANTIALLY BOUND IN CLOTH,
May be had at the Office of this JOURNAL, No. 39 Nassau Street, New York.

OLEO-WATER GAS.

OFFICE OF THE OLEO-WATER & ELECTRO-CHEMICAL GAS MANUFACTURING COMPANY, No. 23 DEY STREET, New York, January 1st, 1863.

The undersigned, agent of the above-named Company, proposes in this special circular to call the attention of Gas Companies throughout the country, and the public, to the merits of the improvement for the manufacture of Illuminating Gas, known as the "OLEO-WATER PROCESS," which is no longer merely an experiment, but a practical success.

We do not design to give here a complete analysis of the theory and practice of making Oleo-Water Gas; but to present the subject in such a manner as will enable parties interested to judge correctly between this and the processes for manufacturing the same, or nearly the same, under the guise of making an Oil Gas *by the aid of water*. It is intended to caution the public against all such, as they are clearly infringements, and will be treated as such by this Company.

The subject of the manufacture and cost of illuminating gas, has assumed proportions of great magnitude, which are augmented by the high prices of coal and freight, rendering all attempts to reduce the price of coal-gas generally impracticable; while the companies situated most remote from sources of supply of the raw material, find they cannot furnish their customers, even at the exorbitant prices which have heretofore prevailed.

Consequently the adoption of petroleum, or other hydro-carbons, with the process of generating the Oleo-Water Gas, seems to be the only salvation for the stockholders of many companies heretofore enjoying a flourishing business.

Existing gas-works may be easily adapted to working the Oleo-Water process, as no changes are necessary except in the retorts, of which a smaller number will be required. This process will produce, with greater facility and far less cost, precisely such quality of gas as may be required. From one gallon of oil and four gallons of water may be generated from four hundred and sixty to five hundred cubic feet of carburetted hydrogen gas of the first quality. It possesses double the illuminating power of gas made from coal; the same number of cubic feet are worth twice as much to the consumer; and a burner consuming three cubic feet per hour will give as much light from this gas as a burner of six feet from coal-gas.

Establishments are now open in this city and vicinity where gas of the first quality is being daily manufactured and consumed at a cost of 20 to 50 cents per 1,000 feet, where the residuum of petroleum is used—or at larger cost, according to the price of oil. The residuum oils are preferable.

It is well known that no process of decomposition will produce from one gallon of petroleum more than from sixty to eighty-five feet of gas, (according to the quality of the oil,) and the densest oils will not produce more than one hundred feet; and therefore any pretended process for making oil gas with the *aid of water*, its constituents or products, claiming to produce more than those quantities, simply claims for the oil the excess due to the decomposition of water, etc.; and is, however sought to be disguised, a palpable infringement of the patents held by this Company. No patents for machinery or apparatus by which the Oleo-Water process may be worked can cover the right to manufacture the Oleo-Water Gas. The sole right to the process being invested in and only transferable by this Company.

From the foregoing statements, parties may avoid all trouble or difficulty by treating only with this Company, or its duly authorized agent.

Arrangements will be made with companies or individuals desirous of substituting the Oleo-Water Gas, or who may wish to erect new works, on reasonable terms. Township, City, County, or State rights for sale.

Parties wishing further information, will please call upon or address
TAPPEN TOWNSEND, Agent.

CLAY RETORTS.

ADDISON POTTER,
WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE, ENGLAND,
Manufacturer of CLAY RETORTS, FIRE BRICKS, and every description of FIRE CLAY GOODS.

PHILADELPHIA FIRE-BRICK Works, corner of Vine and Twenty-third streets, Philadelphia.
JOHN NEWKUMET,
Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice.

PATENT PYRO-CLAY GAS RETORTS. THOMAS HOADLEY, Patentee, wishes to call the attention of Gas-Engineers to these
RETORTS
as a very superior article.
REFERENCES:—Gas-Light Works, Buffalo, N. Y.
" " Cleveland, O.
" " Chicago, Ill.
THOS. HOADLEY,
Corner of Main and Mulberry Sts., Cleveland, O.

NEW YORK FIRE-BRICK Manufactory. (Branch Works at Kreischerville, Staten Island.)
B. KREISCHER & CO., office 56 Goerck street, corner Delancy street, New York.
GAS-HOUSE TILES and FIRE-BRICK of all shapes and sizes. FIRE MORTAR, CLAY, and SAND articles of every description made to order at the shortest notice. B. KREISCHER, M. MAURER, A. WEBER.